REQUEST FOR QUOTATIONS
(THIS IS NOT AN ORDER)

THIS RFQ [X] IS [ ] IS NOT A SMALL BUSINESS SET-ASIDE

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1. REQUEST NO.	2. DATE ISSUED	3. REQUISITION/PURCHASE REQUEST NO.	4. CERT. FOR NAT. DEF. UNDER BDSA REG. 2 AND/OR DMS REG. 1	RATING
VA260-13-Q-0114	12-04-2012			

5A. ISSUED BY
NCO 20
Department of Veterans Affairs
VA NW Health Network - VISN 20
5115 NE 82nd Ave, Suite 203
VANCOUVER WA 98662

6. DELIVER BY (Date)
120 calendar days from NTP

5B. FOR INFORMATION CALL: (No collect calls)

NAME	TELEPHONE NUMBER (AREA CODE / NUMBER)
Alyssa Dark	360-852-9857

7. DELIVERY [ ] FOB DESTINATION [ ] OTHER (See Schedule)

9. DESTINATION
a. NAME OF CONSIGNEE
Department of Veterans Affairs
VA Healthcare System Roseburg

8. TO:

a. NAME	b. COMPANY	b. STREET ADDRESS
Contracting Office		913 NW Garden Valley BLVD

c. STREET ADDRESS	c. CITY
5115 NE 82nd Avenue	Roseburg

d. CITY	e. STATE	f. ZIP CODE	d. STATE	e. ZIP CODE
Vancouver	Wa	98662	OR	97470

10. PLEASE FURNISH QUOTATIONS TO THE ISSUING OFFICE ON OR BEFORE CLOSE OF BUSINESS (Date)
01-03-2013

IMPORTANT: This is a request for information, and quotations furnished are not offers. If you are unable to quote, please so indicate on this form and return it. This request does not commit the Government to pay any costs incurred in the preparation of the submission of this quotation or to contract for supplies or services. Supplies are of domestic origin unless otherwise indicated by quoter. Any representations and/or certifications attached to this Request for Quotations must be completed by the quoter.

11. SCHEDULE (Include applicable Federal, State and local taxes)

ITEM NO. (a)	SUPPLIES/SERVICES (b)	QUANTITY (c)	UNIT (d)	UNIT PRICE (e)	AMOUNT (f)
	Project: 653-13-111 Title: Upgrade Street Lighting Location: Roseburg, Oregon Description: Contractor to provide all necessary equipment, labor, materials and supervision to upgrade street lighting in accordance with the statement of work, specifications, and drawings. This procurement is issued under the terms and conditions of the MATOC for general construction and design-build services for VAMCs located in Oregon and Washington.				

12. DISCOUNT FOR PROMPT PAYMENT	a. 10 CALENDAR DAYS %	b. 20 CALENDAR DAYS %	c. 30 CALENDAR DAYS %	d. CALENDAR DAYS NUMBER	d. CALENDAR DAYS PERCENTAGE

NOTE: Additional provisions and representations [ ] are [ ] are not attached.

13. NAME AND ADDRESS OF QUOTER	14. SIGNATURE OF PERSON AUTHORIZED TO SIGN QUOTATION	15. DATE OF QUOTATION
a. NAME OF QUOTER b. STREET ADDRESS c. COUNTY d. CITY / e. STATE / f. ZIP CODE	16. SIGNER a. Name (Type or print) c. TITLE (Type or print)	b. TELEPHONE AREA CODE / NUMBER

Table of Contents

SCHEDULE

1.1 PRICING SCHEDULE

CLIN	DESCRIPTION	UNIT	QTY	TOTAL
0001	**Base Bid Item:** Includes all items that are described in this solicitation including attached drawings.	**JB**	1	$
0002	**Option NO. 1:** Complete phase 2 street lighting replacement (5 light poles), in accordance with the SOW, specifications, and drawings.	**JB**	1	$
0003	**Option NO. 2:** Complete phase 3 street lighting replacement (12 light poles), in accordance with the SOW, specifications, and drawings.	**JB**	1	$

INSTRUCTIONS, CONDITIONS AND OTHER STATEMENTS TO BIDDERS/OFFERORS

GENERAL:

This procurement is issued under the terms and conditions of your Indefinite Delivery Indefinite Quantity (IDIQ) Multiple Task Order Contract (MATOC). In accordance with (IAW) Federal Acquisition Regulation (FAR) Part 14, Sealed Bidding, the solicitation provisions and contract clauses apply to this procurement.

Quote/bidding materials are available in electronic format, only, and are available to prime contractors that hold an IDIQ MATOC for maintenance, repair and new construction services for stations primarily located in Washington and Oregon. Prime contractors may share bidding materials with subcontractors and suppliers as necessary. However, all questions shall be submitted through/by the prime contractors on behalf of their subcontractors and suppliers.

STATEMENT OF WORK:

The Contractor shall provide all labor, tools, equipment, materials and supplies necessary to perform the work identified in the specifications and drawings. The general work includes, but is not limited to, upgrading street lighting at VA Medical Center, Roseburg, Oregon.

Project Location: Roseburg VA Medical Center, Roseburg, Oregon.

ADDITIONAL TERMS AND CONDITIONS:

A. **Construction Magnitude:** IAW VAAR 836.204, the magnitude of construction is between $100,000 and $250,000.

B. **Payment and Performance Bonds:** Are required per FAR Clause 52.228-15.

C. **Bid Bond:** Is required per FAR 52.228-1.

D. **Work:** The contractor shall execute on site and with his own organization, actual construction work equivalent to not less than 15% of total amount of work to be performed under the contract. Construction by special trade contractors, contractor shall execute on site and with his own organization, actual construction work equivalent to not less than 25% of total amount of work to be performed under the contract.

E. **Special Note:** This procurement is subject to the requirements of the Buy American Act. The requirements are set forth in the General Conditions.

F. **Caution:** No oral statements made by the contract parties or other interested parties will take precedence over the writte terms and conditions of the solicitation or resultant contract.

G. **Prebid Conference and Site Visit:** Site visit will be held on December 13, 2012 at 9:30 a.m. (PST); location is Roseburg VA Medical Center.

H. **Questions Regarding the Solicitation and Project:** Shall be submitted in writing to Alyssa Dark, Contract Specialist, via e-mail at alyssa.dark@va.gov. Contractors shall include Grant Furulie on all questions submitted, at grant.furulie@va.gov. Questions will be accepted up December 20, 2012. The government is not obligated to answer any questions submitted after this date.

Furthermore, **all questions shall** be submitted by the prime contractor(s) on behalf of their subcontractor(s) and supplier(s) to the Contract Specialist. Questions submitted by subcontractors and/or suppliers directly to the Contract Specialist will be rejected and not answered.

I. **RFQ/Bid Due Date:** Quotes/bids are to be submitted electronically, mail or by hand to the assigned Contract Specialist by the date and time indicated in Block 10 of the SF18. A public bid opening will be not be held but the quote/bid results will be provided within 24-hours of the due date and time.

2.1 52.216-1 TYPE OF CONTRACT (APR 1984)

The Government contemplates award of a Firm Fixed Price contract resulting from this solicitation.

(End of Provision)

2.2 52.217-5 EVALUATION OF OPTIONS (JUL 1990)

Except when it is determined in accordance with FAR 17.206(b) not to be in the Government's best interests, the Government will evaluate offers for award purposes by adding the total price for all options to the total price for the basic requirement. Evaluation of options will not obligate the Government to exercise the option(s).

(End of Provision)

2.3 52.222-5 DAVIS-BACON ACT--SECONDARY SITE OF THE WORK (JUL 2005)

(a)(1) The offeror shall notify the Government if the offeror intends to perform work at any secondary site of the work, as defined in paragraph (a)(1)(ii) of the FAR clause at 52.222-6, Davis-Bacon Act, of this solicitation.

(2) If the offeror is unsure if a planned work site satisfies the criteria for a secondary site of the work, the offeror shall request a determination from the Contracting Officer.

(b)(1) If the wage determination provided by the Government for work at the primary site of the work is not applicable to the secondary site of the work, the offeror shall request a wage determination from the Contracting Officer.

(2) The due date for receipt of offers will not be extended as a result of an offeror's request for a wage determination for a secondary site of the work.

(End of Provision)

2.4 52.222-23 NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL EMPLOYMENT OPPORTUNITY FOR CONSTRUCTION (FEB 1999)

(a) The offeror's attention is called to the Equal Opportunity clause and the Affirmative Action Compliance Requirements for Construction clause of this solicitation.

(b) The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

Goals for minority participation for each trade	Goals for female participation for each trade
2.4 %	6.9 %

These goals are applicable to all the Contractor's construction work performed in the covered area. If the Contractor performs construction work in a geographical area located outside of the covered area, the Contractor shall apply the goals

established for the geographical area where the work is actually performed. Goals are published periodically in the Federal Register in notice form, and these notices may be obtained from any Office of Federal Contract Compliance Programs office.

(c) The Contractor's compliance with Executive Order 11246, as amended, and the regulations in 41 CFR 60-4 shall be based on (1) its implementation of the Equal Opportunity clause, (2) specific affirmative action obligations required by the clause entitled "Affirmative Action Compliance Requirements for Construction," and (3) its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade. The Contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor, or from project to project, for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, Executive Order 11246, as amended, and the regulations in 41 CFR 60-4. Compliance with the goals will be measured against the total work hours performed.

(d) The Contractor shall provide written notification to the Deputy Assistant Secretary for Federal Contract Compliance, U.S. Department of Labor, within 10 working days following award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the--

(1) Name, address, and telephone number of the subcontractor;

(2) Employer's identification number of the subcontractor;

(3) Estimated dollar amount of the subcontract;

(4) Estimated starting and completion dates of the subcontract; and

(5) Geographical area in which the subcontract is to be performed.

(e) As used in this Notice, and in any contract resulting from this solicitation, the "covered area" is
Douglas County, Roseburg, Oregon

(End of Provision)

2.5 52.225-10 NOTICE OF BUY AMERICAN ACT REQUIREMENT -- CONSTRUCTION MATERIALS (FEB 2009)

(a) *Definitions.* "Commercially available off-the-shelf (COTS) item," "construction material," "domestic construction material," and "foreign construction material," as used in this provision, are defined in the clause of this solicitation entitled "Buy American Act--Construction Materials" (Federal Acquisition Regulation (FAR) clause 52.225-9).

(b) *Requests for determinations of inapplicability.* An offeror requesting a determination regarding the inapplicability of the Buy American Act should submit the request to the Contracting Officer in time to allow a determination before submission of offers. The offeror shall include the information and applicable supporting data required by paragraphs (c) and (d) of the clause at FAR 52.225-9 in the request. If an offeror has not requested a determination regarding the inapplicability of the Buy American Act before submitting its offer, or has not received a response to a previous request, the offeror shall include the information and supporting data in the offer.

(c) Evaluation of offers.

(1) The Government will evaluate an offer requesting exception to the requirements of the Buy American Act, based on claimed unreasonable cost of domestic construction material, by adding to the offered price the appropriate percentage of the cost of such foreign construction material, as specified in paragraph (b)(3)(i) of the clause at FAR 52.225-9.

(2) If evaluation results in a tie between an offeror that requested the substitution of foreign construction material based on unreasonable cost and an offeror that did not request an exception, the Contracting Officer will award to the offeror that did not request an exception based on unreasonable cost.

(d) Alternate offers.

(1) When an offer includes foreign solicitation in paragraph (b)(2) of the clause at FAR 52.225-9, the offeror also may submit an alternate offer based on use of equivalent domestic construction material.

(2) If an alternate offer is submitted, the offeror shall submit a separate Standard Form 1442 for the alternate offer, and a separate price comparison table prepared in accordance with paragraphs (c) and (d) of the clause at FAR 52.225-9 for the offer that is based on the use of any foreign construction material for which the Government has not yet determined an exception applies.

(3) If the Government determines that a particular exception requested in accordance with paragraph (c) of the clause at FAR 52.225-9 does not apply, the Government will evaluate only those offers based on use of the equivalent domestic construction material, and the offeror shall be required to furnish such domestic construction material. An offer based on use of the foreign construction material for which an exception was requested--

(i) Will be rejected as nonresponsive if this acquisition is conducted by sealed bidding; or

(ii) May be accepted if revised during negotiations.

(End of Provision)

2.6 52.228-1 BID GUARANTEE (SEP 1996)

(a) Failure to furnish a bid guarantee in the proper form and amount, by the time set for opening of bids, may be cause for rejection of the bid.

(b) The bidder shall furnish a bid guarantee in the form of a firm commitment, e.g., bid bond supported by good and sufficient surety or sureties acceptable to the Government, postal money order, certified check, cashier's check, irrevocable letter of credit, or, under Treasury Department regulations, certain bonds or notes of the United States. The Contracting Officer will return bid guarantees, other than bid bonds, (1) to unsuccessful bidders as soon as practicable after the opening of bids, and (2) to the successful bidder upon execution of contractual documents and bonds (including any necessary coinsurance or reinsurance agreements), as required by the bid as accepted.-

(c) The amount of the bid guarantee shall be 20 percent of the bid price or $3,000,000.00, whichever is less.-

(d) If the successful bidder, upon acceptance of its bid by the Government within the period specified for acceptance, fails to execute all contractual documents or furnish executed bond(s) within 10 days after receipt of the forms by the bidder, the Contracting Officer may terminate the contract for default.

(e) In the event the contract is terminated for default, the bidder is liable for any cost of acquiring the work that exceeds the amount of its bid, and the bid guarantee is available to offset the difference.

(End of Provision)

2.7 52.236-27 SITE VISIT (CONSTRUCTION) (FEB 1995) ALTERNATE I (FEB 1995)

(a) The clauses at 52.236-2, Differing Site Conditions, and 52.236-3, Site Investigations and Conditions Affecting the Work, will be included in any contract awarded as a result of this solicitation. Accordingly, offerors or quoters are urged and expected to inspect the site where the work will be performed.

(b) An organized site visit has been scheduled for-

December 13, 2012 at 9:30 a.m. (PST)

(c) Participants will meet at-

Roseburg VA Medical Center, Roseburg, Oregon

(End of Provision)

2.8 VAAR 852.270-1 REPRESENTATIVES OF CONTRACTING OFFICERS (JAN 2008)

The contracting officer reserves the right to designate representatives to act for him/her in furnishing technical guidance and advice or generally monitor the work to be performed under this contract. Such designation will be in writing and will define the scope and limitation of the designee's authority. A copy of the designation shall be furnished to the contractor.

(End of Provision)

REPRESENTATIONS AND CERTIFICATIONS

3.1 52.204-8 ANNUAL REPRESENTATIONS AND CERTIFICATIONS (MAY 2012)

(a)(1) The North American Industry Classification System (NAICS) code for this acquisition is 236220.

(2) The small business size standard is $33,500,000.00.

(3) The small business size standard for a concern which submits an offer in its own name, other than on a construction or service contract, but which proposes to furnish a product which it did not itself manufacture, is 500 employees.

(b)(1) If the clause at 52.204-7, Central Contractor Registration, is included in this solicitation, paragraph (d) of this provision applies.

(2) If the clause at 52.204-7 is not included in this solicitation, and the offeror is currently registered in CCR, and has completed the ORCA electronically, the offeror may choose to use paragraph (d) of this provision instead of completing the corresponding individual representations and certifications in the solicitation. The offeror shall indicate which option applies by checking one of the following boxes:

[ ] (i) Paragraph (d) applies.
[ ] (ii) Paragraph (d) does not apply and the offeror has completed the individual representations and certifications in the solicitation.

(c)(1) The following representations or certifications in ORCA are applicable to this solicitation as indicated:

(i) 52.203-2, Certificate of Independent Price Determination. This provision applies to solicitations when a firm-fixed-price contract or fixed-price contract with economic price adjustment is contemplated, unless--

(A) The acquisition is to be made under the simplified acquisition procedures in Part 13;

(B) The solicitation is a request for technical proposals under two-step sealed bidding procedures; or

(C) The solicitation is for utility services for which rates are set by law or regulation.

(ii) 52.203-11, Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions. This provision applies to solicitations expected to exceed $150,000.

(iii) 52.204-3, Taxpayer Identification. This provision applies to solicitations that do not include the clause at 52.204-7, Central Contractor Registration.

(iv) 52.204-5, Women-Owned Business (Other Than Small Business). This provision applies to solicitations that--

(A) Are not set aside for small business concerns;

(B) Exceed the simplified acquisition threshold; and

(C) Are for contracts that will be performed in the United States or its outlying areas.

(v) 52.209-2, Prohibition on Contracting with Inverted Domestic Corporations--Representation. This provision applies to solicitations using funds appropriated in fiscal years 2008, 2009, 2010, or 2012.

(vi) 52.209-5, Certification Regarding Responsibility Matters. This provision applies to solicitations where the contract value is expected to exceed the simplified acquisition threshold.

(vii) 52.214-14, Place of Performance--Sealed Bidding. This provision applies to invitations for bids except those in which the place of performance is specified by the Government.

(viii) 52.215-6, Place of Performance. This provision applies to solicitations unless the place of performance is specified by the Government.

(ix) 52.219-1, Small Business Program Representations (Basic & Alternate I). This provision applies to solicitations when the contract will be performed in the United States or its outlying areas.

(A) The basic provision applies when the solicitations are issued by other than DoD, NASA, and the Coast Guard.

(B) The provision with its Alternate I applies to solicitations issued by DoD, NASA, or the Coast Guard.

(x) 52.219-2, Equal Low Bids. This provision applies to solicitations when contracting by sealed bidding and the contract will be performed in the United States or its outlying areas.

(xi) 52.222-22, Previous Contracts and Compliance Reports. This provision applies to solicitations that include the clause at 52.222-26, Equal Opportunity.

(xii) 52.222-25, Affirmative Action Compliance. This provision applies to solicitations, other than those for construction, when the solicitation includes the clause at 52.222-26, Equal Opportunity.

(xiii) 52.222-38, Compliance with Veterans' Employment Reporting Requirements. This provision applies to solicitations when it is anticipated the contract award will exceed the simplified acquisition threshold and the contract is not for acquisition of commercial items.

(xiv) 52.223-1, Biobased Product Certification. This provision applies to solicitations that require the delivery or specify the use of USDA-designated items; or include the clause at 52.223-2, Affirmative Procurement of Biobased Products Under Service and Construction Contracts.

(xv) 52.223-4, Recovered Material Certification. This provision applies to solicitations that are for, or specify the use of, EPA-designated items.

(xvi) 52.225-2, Buy American Act Certificate. This provision applies to solicitations containing the clause at 52.225-1.

(xvii) 52.225-4, Buy American Act--Free Trade Agreements--Israeli Trade Act Certificate. (Basic, Alternates I, II, and III.) This provision applies to solicitations containing the clause at 52.225-3.

(A) If the acquisition value is less than $25,000, the basic provision applies.

(B) If the acquisition value is $25,000 or more but is less than $50,000, the provision with its Alternate I applies.

(C) If the acquisition value is $50,000 or more but is less than $77,494, the provision with its Alternate II applies.

(D) If the acquisition value is $77,494 or more but is less than $100,000, the provision with its Alternate III applies.

(xviii) 52.225-6, Trade Agreements Certificate. This provision applies to solicitations containing the clause at 52.225-5.

(xix) 52.225-20, Prohibition on Conducting Restricted Business Operations in Sudan--Certification. This provision applies to all solicitations.

(xx) 52.225-25, Prohibition on Contracting with Entities Engaging in Sanctioned Activities Relating to Iran--Representation and Certification. This provision applies to all solicitations.

(xxi) 52.226-2, Historically Black College or University and Minority Institution Representation. This provision applies to--

(A) Solicitations for research, studies, supplies, or services of the type normally acquired from higher educational institutions; and

(B) For DoD, NASA, and Coast Guard acquisitions, solicitations that contain the clause at 52.219-23, Notice of Price Evaluation Adjustment for Small Disadvantaged Business Concerns.

(2) The following certifications are applicable as indicated by the Contracting Officer:

[](i) 52.219-22, Small Disadvantaged Business Status.

[](A) Basic.

[](B) Alternate I.

[](ii) 52.222-18, Certification Regarding Knowledge of Child Labor for Listed End Products.

[](iii) 52.222-48, Exemption from Application of the Service Contract Act to Contracts for Maintenance, Calibration, or Repair of Certain Equipment Certification.

[](iv) 52.222-52 Exemption from Application of the Service Contract Act to Contracts for Certain Services--Certification.

[](v) 52.223-9, with its Alternate I, Estimate of Percentage of Recovered Material Content for EPA-Designated Products (Alternate I only).

[](vi) 52.227-6, Royalty Information.

[](A) Basic.

[](B) Alternate I.

[](vii) 52.227-15, Representation of Limited Rights Data and Restricted Computer Software.

(d) The offeror has completed the annual representations and certifications electronically via the Online Representations and Certifications Application (ORCA) website accessed through https://www.acquisition.gov. After reviewing the ORCA database information, the offeror verifies by submission of the offer that the representations and certifications currently posted electronically that apply to this solicitation as indicated in paragraph (c) of this provision have been entered or updated within the last 12 months, are current, accurate, complete, and applicable to this solicitation (including the business size standard applicable to the NAICS code referenced for this solicitation), as of the date of this offer and are incorporated in this offer by reference (see FAR 4.1201); except for the changes identified below [offeror to insert changes, identifying change by clause number, title, date]. These amended representation(s) and/or certification(s) are also incorporated in this offer and are current, accurate, and complete as of the date of this offer.

FAR Clause #	Title	Date	Change
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Any changes provided by the offeror are applicable to this solicitation only, and do not result in an update to the representations and certifications posted on ORCA.

(End of Provision)

GENERAL CONDITIONS

4.1 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK (APR 1984)

The Contractor shall be required to (a) commence work under this contract within 10 calendar days after the date the Contractor receives the notice to proceed, (b) prosecute the work diligently, and (c) complete the entire work ready for use not later than 120 calendar days from NTP. The time stated for completion shall include final cleanup of the premises.

(End of Clause)

4.2 52.217-7 OPTION FOR INCREASED QUANTITY--SEPARATELY PRICED LINE ITEM (MAR 1989)

The Government may require the delivery of the numbered line item, identified in the Schedule as an option item, in the quantity and at the price stated in the Schedule. The Contracting Officer may exercise the option by written notice to the Contractor within 120 calendar days from NTP. Delivery of added items shall continue at the same rate that like items are called for under the contract, unless the parties otherwise agree.

(End of Clause)

4.3 52.228-15 PERFORMANCE AND PAYMENT BONDS-- CONSTRUCTION (OCT 2010)

(a) *Definitions*. As used in this clause--

"Original contract price" means the award price of the contract; or, for requirements contracts, the price payable for the estimated total quantity; or, for indefinite-quantity contracts, the price payable for the specified minimum quantity. Original contract price does not include the price of any options, except those options exercised at the time of contract award.

(b) *Amount of required bonds*. Unless the resulting contract price is $150,000 or less, the successful offeror shall furnish performance and payment bonds to the Contracting Officer as follows:

(1) *Performance bonds* (Standard Form 25). The penal amount of performance bonds at the time of contract award shall be 100 percent of the original contract price.

(2) *Payment Bonds* (Standard Form 25-A). The penal amount of payment bonds at the time of contract award shall be 100 percent of the original contract price.

(3) Additional bond protection.

(i) The Government may require additional performance and payment bond protection if the contract price is increased. The increase in protection generally will equal 100 percent of the increase in contract price.

(ii) The Government may secure the additional protection by directing the Contractor to increase the penal amount of the existing bond or to obtain an additional bond.

(c) *Furnishing executed bonds*. The Contractor shall furnish all executed bonds, including any necessary reinsurance agreements, to the Contracting Officer, within the time period specified in the Bid Guarantee provision of the solicitation, or otherwise specified by the Contracting Officer, but in any event, before starting work.

(d) *Surety or other security for bonds*. The bonds shall be in the form of firm commitment, supported by corporate sureties whose names appear on the list contained in Treasury Department Circular 570, individual sureties, or by other

acceptable security such as postal money order, certified check, cashier's check, irrevocable letter of credit, or, in accordance with Treasury Department regulations, certain bonds or notes of the United States. Treasury Circular 570 is published in the *Federal Register* or may be obtained from the:

U.S. Department of Treasury
Financial Management Service
Surety Bond Branch
3700 East West Highway, Room 6F01
Hyattsville, MD 20782.
Or via the internet at http://www.fms.treas.gov/c570/.

(e) *Notice of subcontractor waiver of protection (40 U.S.C. 3133(c)).* Any waiver of the right to sue on the payment bond is void unless it is in writing, signed by the person whose right is waived, and executed after such person has first furnished labor or material for use in the performance of the contract.

(End of Clause)

4.4 LIST OF ATTACHMENTS:

See attached document: Attachment 1 Wage Decision.

See attached document: Attachment 2 Specifications.

See attached document: Attachment 3 Drawings.

See attached document: Attachment 4 SOW.

General Decision Number: OR120036 09/21/2012 OR36

Superseded General Decision Number: OR20100050

State: Oregon

Construction Type: Building

County: Douglas County in Oregon.

BUILDING CONSTRUCTION PROJECTS (does not include single family homes or apartments up to and including 4 stories).

Modification Number	Publication Date
0	01/06/2012
1	01/13/2012
2	01/27/2012
3	03/02/2012
4	03/09/2012
5	04/06/2012
6	06/15/2012
7	06/29/2012
8	08/03/2012
9	08/31/2012
10	09/21/2012

BROR0001-018 06/01/2012

	Rates	Fringes
BRICKLAYER	$ 32.75	15.80
TILE FINISHER	$ 21.86	10.19
TILE SETTER	$ 29.19	13.27

CARP0001-032 10/01/2011

	Rates	Fringes
Carpenters:		
Including Metal stud installation and form work	$ 32.04	14.18

CARP9001-004 06/20/2007

	Rates	Fringes
Acoustical Ceiling Installer & Drywall Hanger	$ 27.95	13.52

ELEC0659-014 01/01/2012

DOUGLAS (THAT PORTION EAST OF THE COASTAL WATERSHED DIVIDE) COUNTY

	Rates	Fringes
ELECTRICIAN	$ 30.02	14.45

ELEC0659-015 01/01/2012

DOUGLAS (THAT PORTION EAST OF THE COASTAL WATERSHED DIVIDE) COUNTY

	Rates	Fringes
ELECTRICIAN		
Computer Installation, low voltage wiring for computers and telephone installation	$ 16.00	10.90
Electrical Installers Alarms and Low Voltage Wiring for Alarms	$ 24.90	10.90

ELEC0932-014 01/01/2012

DOUGLAS REMAINDER OF COUNTY

	Rates	Fringes
ELECTRICIAN	$ 32.45	13.98

ELEC0932-015 07/01/2011

DOUGLAS REMAINDER OF COUNTY

	Rates	Fringes
ELECTRICIAN (Electrical installer alarms, low voltage wiring for alarms, low voltage wiring for computers, computer installation and telehone installation.)	$ 24.70	12.24

ENGI0701-026 01/01/2012

	Rates	Fringes
Power equipment operators:		
GROUP 1	$ 37.27	12.08
GROUP 1A	$ 39.13	12.08
GROUP 1B	$ 41.00	12.08
GROUP 2	$ 35.64	12.08
GROUP 3	$ 34.65	12.08
GROUP 4	$ 33.71	12.08
GROUP 5	$ 32.60	12.08
GROUP 6	$ 29.61	12.08

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: CRANE: Helicopter Operator, when used in erecting work; Whirley Operator, 90 ton and over; LATTICE BOOM CRANE: Operator 200 tons through 299 tons, and/or over 200 feet boom; HYDRAULIC CRANE: Hydraulic Crane Operator 90 tons through 199 tons with luffing or tower attachments

GROUP 1A: HYDRAULIC CRANE: Hydraulic Operator, 200 tons and over (with luffing or tower attachment); LATTICE BOOM CRANE: Operator, 200 tons through 299 tons, with over 200 feet boom;

GROUP 1B: LATTICE BOOM CRANE: Operator, 300 tons through 399 tons with over 200 feet boom; Operator 400 tons and over

GROUP 2: CRANE: Cableway Operator, 25 tons and over; HYDRAULIC CRANE: Hydraulic crane operator 90 tons through 199 tons (without luffing or tower attachment); TOWER/WHIRLEY OPERATOR: Tower Crane Operator; Whirley

Operator, under 90 tons; LATTICE BOOM CRANE: 90 through 199 tons and/or 150 to 200 feet boom; HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (with luffing or tower attachment); BLADE: Auto Grader;Blade Operator-Robotic; Bulldozer: Over 120,000 lbs and above; Bulldozer: D-10, D-11 and similar type; Loader: 120,000 lbs and above

GROUP 3: HYDRAULIC CRANE: Hydraulic crane operator, 50 tons through 89 tons (without luffing or tower attachment); LATTICE BOOM CRANES: Lattice Boom Crane-50 through 89 tons (and less than 150 feet boom); Bulldozer: over 70,000 lbs up to and including 120,000; Loader: 60,000 lbs and less than 120,000 lbs

GROUP 4: CRANE: Hydraulic Crane Operator, under 50 tons; LATTICE BOOM CRANE OPERATOR: Lattice Boom Crane Operator, under 50 tons; TRACKHOE/BACKHOE-ROBOTIC: up to and including 20,0000 lbs. with any or all attachments; BLADE: Blade operator; Tractor operator with boom attachment; DRILLING: Churm Drill and Earth Boring Machine Operator; Directional Drill Operator over 20,000 lbs pullback; CRANE: Chicago boom and similar types; Boom type lifting device, 5 ton capacity or less; Asphalt Paver; Mechanic; Bulldozer: over 20,000 lbs and more than 100 horse and up to 70,000 lbs; Loader: 25,000 lbs and less than 60,000 lbs; Screed

GROUP 5: TRACKHOE/BACKHOE-HYDRAULIC: up to and including 20,000 lbs.; Open wheeled type; DRILLING: Churm Drill and Earth Boring Machine Operator; Directional Drill Operator less than 20,000 lbs pullback; Concrete Pumper; Concrete Paver; forlkift over 5 ton; Bulldozer: 20,000 lbs or less, or 100 horse or less; Loader: ruber tired type, less than 25,000 lbs; Roller

GROUP 6: LOADERS: (less than 1 cu yd.); Oiler; Crane oiler; forklift; Broom; Roller (Non-Asphalt)

IRON0029-013 01/01/2012

	Rates	Fringes
IRONWORKER (Reinforcing and Structural).....	$ 33.87	20.10

LABO0001-030 06/01/2008

	Rates	Fringes
Laborers: (Mason Tender-Cement/Concrete)	$ 25.75	11.25

LABO0001-031 06/01/2008

	Rates	Fringes
Laborers: (Mason Tender-Brick)	$ 25.75	11.25

LABO0003-016 06/01/2010

	Rates	Fringes
Laborers:		
GROUP 1	$ 25.25	12.07
GROUP 4	$ 26.80	12.07
GROUP 5	$ 21.99	12.07

LABORER CLASSIFICATIONS

GROUP 1: Form-Stripping; General Laborer

GROUP 4: Grade Checker, Pipelayer

GROUP 5: Flagger

PAIN0055-024 08/13/2012

	Rates	Fringes
DRYWALL FINISHER/TAPER	$ 32.22	12.40

PAIN0055-027 07/01/2009

	Rates	Fringes
Painters:		
Brush, Roller and Spray	$ 16.59	7.24

PLAS0082-003 06/01/2011

	Rates	Fringes
PLASTERER	$ 25.08	11.32

PLAS0555-006 06/01/2012

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 29.98	17.76

PLUM0290-012 04/01/2011

	Rates	Fringes
PIPEFITTER	$ 36.69	20.09

SUOR2009-034 11/09/2009

	Rates	Fringes
OPERATOR: Excavator	$ 21.68	5.72
PLUMBER	$ 27.32	9.86
SHEET METAL WORKER (Metal Roofs Installation)	$ 23.65	6.33
SHEET METAL WORKER, Excludes Metal Roof Installation	$ 29.23	4.16

* TEAM0037-008 06/01/2012

	Rates	Fringes
Truck drivers:		
GROUP 1	$ 26.90	13.25
GROUP 2	$ 27.02	13.25
GROUP 3	$ 27.15	13.25
GROUP 4	$ 27.41	13.25
GROUP 5	$ 27.63	13.25
GROUP 6	$ 27.79	13.25
GROUP 7	$ 27.99	13.25

TRUCK DRIVERS CLASSIFICATIONS

GROUP 1: Dump trucks, side, end and bottom dumps: up to and including 10 cu. yds.

GROUP 2: Dump trcuks/articulated dumps 6 cu to 10 cu.;

GROUP 3: Dump trucks, side, end and bottom dumps: over 10 cu. yds. and including 30 cu. yds., includes articulated dump trucks

GROUP 4: Dump trucks, side, end and bottom dumps: over 30 cu. yds. and including 50 cu. yds. and includes articulated dump trucks

GROUP 5: Dump trucks, side, end and bottom dumps: over 50 cu. yds. and including 60 cu. yds. and includes articulated dump trucks

GROUP 6: Dump trucks, side, end and bottom dumps: over 60 cu. yds. and including 80 cu. yds. and includes articulated dump trucks

GROUP 7: Dump trucks, side, end and bottom dumps: over 80 cu. yds. and including 100 cu. yds., includes articulated dump trucks

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WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rate.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material,

etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION

DEPARTMENT OF VETERANS AFFAIRS

Upgrade Street Lighting

Project # 653-12-111

SECTION 01 00 00
GENERAL REQUIREMENTS

TABLE OF CONTENTS

SECTION 01 00 00
GENERAL REQUIREMENTS

1.1 GENERAL INTENTION

A. **Project Summary**: This work will include removing and replacing street lighting fixtures. Work includes, but is not limited to the following:

1. Removal of existing light pole and base to prepare for new light pole installation.

2. Installation of new light pole base, decorative light pole and fixture and reconnect to lighting power.

B. Visits to the site by Bidders may be made only by appointment with the COTR.

C. All employees of general contractor and subcontractors shall comply with VA security management program and obtain permission from the VA police, be identified by project and employer, and restricted from unauthorized access.

E. Prior to commencing work, general contractor shall provide proof that a OSHA certified "competent person" (CP) (29 CFR 1926.20(b)(2) will be providing oversight throughout this work.

F. Training:

1. All employees of general contractor or subcontractors shall have the 10-hour OSHA certified Construction Safety course and /or other relevant competency training, as determined by VA CP with input from the ICRA team.

2. Submit training records of all such employees for approval before the start of work.

1.2 STATEMENT OF BID ITEM(S)

A. ITEM I, GENERAL CONSTRUCTION: See Project Summary above.

Base Bid Item: - Phase 1 street lighting replacement (8 light poles). Includes all items that are described in this solicitation including attached drawings as part of the Phase I street lighting replacement.

Option NO. 1: Phase 2 street lighting replacement (5 light poles). Includes all items that are described in this solicitation including attached drawings as part of the Phase 2 street lighting replacement.

Option NO. 2: Phase 3 street lighting replacement (12 light poles). Includes all items that are described in this solicitation including attached drawings as part of the Phase 3 street lighting replacement.

1.3 SPECIFICATIONS AND DRAWINGS FOR CONTRACTOR

A. AFTER AWARD OF CONTRACT, the VA will furnish the contractor with a CD containing the specifications and drawings.

B. Sets of drawings may be made by the Contractor, at Contractor's expense, and distributed accordingly to the contractor's subcontractors as needed.

C. The Specifications, which are applicable to the work on this project, are:

- APWA/ODOT 2008 edition of the "Oregon Standard Specifications for Construction".

Bound copies of the book are available for purchase at Contractor Plans (Phone: 503-986-6936), or an order form can be downloaded for purchasing on the internet at :

http://www.oregon.gov/ODOT/HWY/SPECS/standard_specifications.shtml

1.4 CONSTRUCTION SECURITY REQUIREMENETS

A. Security Plan:

1. The security plan defines both physical and administrative security procedures that will remain effective for the entire duration of the project.

2. The General Contractor is responsible for assuring that all sub-contractors working on the project and their employees also comply with these regulations.

B. Security Procedures:

1. General Contractor's employees shall not enter the project site without appropriate badge. They may also be subject to inspection of their personal effects when entering or leaving the project site.

2. For working outside the "regular hours" as defined in the contract, The General Contractor shall give 3 days notice to the Contracting Officer (COTR) so that security arrangements can

be provided for the employees. This notice is separate from any notices required for utility shutdown described later in this section.

3. No photography of VA premises is allowed without written permission of the Contracting Officer (COTR).

4. VA reserves the right to close down or shut down the project site and order General Contractor's employees off the premises in the event of a national emergency. The General Contractor may return to the site only with the written approval of the Contracting Officer (COTR).

C. Key Control:

1. The General Contractor shall provide duplicate keys and lock combinations to the Engineering Technician (COTR) for the purpose of security inspections of every area of project including tool boxes and parked machines and take any emergency action.

D. Document Control:

1. Before starting any work, the General Contractor/Sub Contractors shall submit an electronic security memorandum describing the approach to following goals and maintaining confidentiality of "sensitive information".

2. The General Contractor is responsible for safekeeping of all drawings, project manual and other project information. This information shall be shared only with those with a specific need to accomplish the project.

4. Certain documents, sketches, videos or photographs and drawings may be marked "Law Enforcement Sensitive" or "Sensitive Unclassified". Secure such information in separate containers and limit the access to only those who will need it for the project. Return the information to the Contracting Officer (COTR) upon request.

5. These security documents shall not be removed or transmitted from the project site without the written approval of Contracting Officer (COTR).

6. All paper waste or electronic media such as CD's and diskettes shall be shredded and destroyed in a manner acceptable to the VA.

7. Notify Contracting Officer (COTR) and Site Security Officer immediately when there is a loss or compromise of "sensitive information".

8. All electronic information shall be stored in specified location following VA standards and procedures using an Engineering Document Management Software (EDMS).

a. Security, access and maintenance of all project drawings, both scanned and electronic shall be performed and tracked through the EDMS system.

b. "Sensitive information" including drawings and other documents may be attached to e-mail provided all VA encryption procedures are followed.

F. Motor Vehicle Restrictions

1. Vehicle authorization request shall be required for any vehicle entering the site and such request shall be submitted 24 hours before the date and time of access. Access to loading docks shall be restricted to only picking up and dropping off materials and supplies. Contractor shall park in areas as designated by COTR.

2. Separate permits shall be issued for General Contractor and its employees for parking in designated areas only.

1.5 FIRE SAFETY

A. Applicable Publications: Publications listed below form part of this Article to extent referenced. Publications are referenced in text by basic designations only.

1. American Society for Testing and Materials (ASTM):

E84-2008 ..... Surface Burning Characteristics of Building Materials

2. National Fire Protection Association (NFPA):

10-2006..... Standard for Portable Fire Extinguishers

30-2007..... Flammable and Combustible Liquids Code

51B-2003..... Standard for Fire Prevention During Welding, Cutting and Other Hot Work

70-2007..... National Electrical Code

241-2004..... Standard for Safeguarding Construction, Alteration, and Demolition Operations

3. Occupational Safety and Health Administration (OSHA):

29 CFR 1926 ..... Safety and Health Regulations for Construction

Fire Safety Plan: Establish and maintain a fire protection program in accordance with 29 CFR 1926. Prior to start of work, prepare a plan detailing project-specific fire safety measures, including periodic status reports, and submit to Engineering Technician (COTR) and Facility Safety Officer for review for compliance with contract requirements in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA AND SAMPLES Prior to any worker for the contractor or subcontractors beginning work, they shall undergo a safety briefing provided by the general contractor's competent person per OSHA requirements. This briefing shall include information on the construction limits, VAMC safety guidelines, means of egress, break areas, work hours, locations of restrooms, use of VAMC equipment, etc. Documentation shall be provided to the Engineering Technician (COTR) that individuals have undergone contractor's safety briefing.

C. Site and Building Access: Maintain free and unobstructed access to Facility emergency services and for fire, police and other emergency response forces in accordance with NFPA 241.

D. Separate temporary facilities, such as trailers, storage sheds, and dumpsters, from existing buildings and new construction by distances in accordance with NFPA 241. For small facilities with less than 6 m (20 feet) exposing overall length, separate by 3m (10 feet).

E. Temporary Construction Partitions: Install and maintain temporary construction partitions as needed or directed by COTR.

F. Temporary Heating and Electrical: Install, use and maintain installations in accordance with 29 CFR 1926, NFPA 241 and NFPA 70.

G. Means of Egress: Do not block exiting for occupied buildings, including paths from exits to roads. Minimize disruptions and coordinate with Engineering Technician (COTR) and Facility Safety Officer.

H. Egress Routes for Construction Workers: Maintain free and unobstructed egress. Inspect daily. Report findings and corrective actions weekly to Engineering Technician (COTR) and Facility Safety Officer.

I. Fire Extinguishers: Provide and maintain extinguishers in construction areas and temporary storage areas in accordance with 29 CFR 1926, NFPA 241 and NFPA 10.

J. Flammable and Combustible Liquids: Store, dispense and use liquids in accordance with 29 CFR 1926, NFPA 241 and NFPA 30.

K. Existing Fire Protection: Do not impair automatic sprinklers, smoke and heat detection, and fire alarm systems, except for portions immediately under construction, and temporarily for connections. Provide fire watch for impairments more than 4 hours in a 24-hour period. Request interruptions in accordance with Article, OPERATIONS AND STORAGE AREAS, and coordinate with Engineering Technician (COTR) and Facility Safety Officer. All existing or temporary fire protection systems (fire alarms, sprinklers) located in construction areas shall be tested as coordinated with the medical center. Parameters for the testing and results of any tests performed shall be recorded by the medical center and copies provided to the Engineering Technician (COTR).

L. Hot Work: Perform and safeguard hot work operations in accordance with NFPA 241 and NFPA 51B. Coordinate with Engineering Technician (COTR). Obtain permits from Engineering Technician at least 48 hours in advance. Designate contractor's responsible project-site fire prevention program manager to permit hot work.

M. Fire Hazard Prevention and Safety Inspections: Inspect entire construction areas weekly. Coordinate with, and report findings and corrective actions weekly to Engineering Technician (COTR) and Facility Safety Officer .

N. Smoking: Smoking is prohibited in and adjacent to construction areas inside existing buildings and additions under construction. In separate and detached buildings under construction, smoking is prohibited except in designated smoking rest areas.

O. Dispose of waste and debris in accordance with NFPA 241. Remove from buildings daily.

P. Perform other construction, alteration and demolition operations in accordance with 29 CFR 1926.

Q. If required, submit documentation to the Engineering Technician (COTR) that personnel have been trained in the fire safety aspects of working in areas with impaired structural or compartmentalization features.

1.6 OPERATIONS, TEMPORARY FACILITIES AND STORAGE AREAS

A. The Contractor shall confine all operations (including storage of materials) on Government premises to areas authorized or approved by the Contracting Officer (COTR). The Contractor shall hold and save the Government, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance.

B. Temporary buildings (e.g., storage sheds, shops, offices) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the Government. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

C. The Contractor shall, under regulations prescribed by the Contracting Officer (COTR), use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any Federal, State, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

D. Working space and space available for storing materials shall as determined by the Engineering Technician (COTR).

E. Workmen are subject to rules of Medical Center applicable to their conduct.

F. Execute work so as to interfere as little as possible with normal functioning of Medical Center as a whole, including operations of utility services, fire protection systems and any existing equipment, and with work being done by others. Use of equipment and tools that transmit vibrations and noises through the building structure, are not permitted in buildings that are occupied, during construction, jointly by patients or medical personnel, and Contractor's personnel, except as permitted by Engineering Technician (COTR) where required by limited working space.

1. Do not store materials and equipment in other than assigned areas.

2. Schedule delivery of materials and equipment to immediate construction working areas within buildings in use by Department of Veterans Affairs in quantities sufficient for not more than two workdays or as approved by the COTR. Provide unobstructed access to Medical Center areas required to remain in operation.

3. Where access by Medical Center personnel to vacated portions of buildings is not required, storage of Contractor's materials and equipment will be permitted subject to fire and safety requirements.

G. Phasing: To insure such executions, Contractor shall furnish the Engineering Technician (COTR) with a schedule of approximate phasing dates on which the Contractor intends to accomplish work in each specific area of site, building or portion thereof.

H. Owner occupation and use of the space. Will require coordination and cooperation between the Contractor and the VA staff at all times.

I. Utilities Services: Take care to maintain existing utility services for Medical Center at all times.

1. No utility service such as water, gas, steam, sewers or electricity, or fire protection systems and communications systems may be interrupted without prior approval of Engineering Technician (COTR).

2. Contractor shall submit a request to interrupt any such services to Engineering Technician, in writing, 48 hours in advance of proposed interruption. Request shall state reason, date, exact time of, and approximate duration of such interruption.

3. Contractor will be advised (in writing) of approval of request, or of which other date and/or time such interruption will cause least inconvenience to operations of Medical Center . Interruption time approved by Medical Center may occur at other than Contractor's normal working hours.

4. In case of a contract construction emergency, service will be interrupted on approval of Engineering Technician (COTR). Such approval will be confirmed in writing as soon as practical.

J. To minimize interference of construction activities with flow of Medical Center traffic, comply with the following:

1. Keep roads, walks and entrances to grounds, to parking and to occupied areas of buildings clear of construction materials, debris and standing construction equipment and vehicles.

2. If the Contractor elects to modify or provide temporary road and access to the project, method and scheduling of required cutting, altering and removal of existing roads, walks and entrances must be approved by the Engineering Technician (COTR).

K. Coordinate the work for this contract with other construction operations as directed by Engineering Technician (COTR). This includes the scheduling of traffic and the use of roadways, as specified in Article, USE OF ROADWAYS.

L. Construction Fence: Before construction operations begin, Contractor shall provide a chain link construction fence, 2100 mm (seven feet) minimum height, around the construction area indicated on the drawings. Provide gates as required for access with necessary hardware, including hasps and padlocks. Fasten fence fabric to terminal posts with tension bands and to line posts and top and bottom rails with tie wires spaced at maximum 15 inches. Bottom of fences shall extend to one inch above grade. Remove the fence upon completion of all work items. All pedestrian areas including entrances required for ingress/egress and as shown on the drawings shall be protected from overhead risks.

1.7 USE OF EXISTING ROADS & PARKING LOT AREAS, ALTERATIONS

A. Survey: Before any work is started, the Contractor shall make a thorough survey with the Engineering Technician (COTR) and a representative of VA Supply Service, of parking lot areas in which alterations occur and areas which are anticipated routes of access, and furnish a report, signed by all three, to the Contracting Officer. This report shall list:

1. Any discrepancies between drawings and existing conditions at site.

2. Designated areas for working space, materials storage and routes of access to areas within the VA grounds where alterations occur and which have been agreed upon by Contractor and Engineering Technician (COTR).

B. Re-Survey: Thirty days before expected partial or final inspection date, the Contractor and Engineering Technician (COTR) together shall make a thorough re-survey of the areas involved. They shall furnish a report on conditions then existing, and compare it with conditions of same as noted in first condition survey report:

1. Re-survey report shall also list any damage caused by Contractor to such roadway and parking surfaces, despite protection measures; and, will form basis for determining extent of repair work required of Contractor to restore damage caused by Contractor's workmen in executing work of this contract.

C. Protection: Provide the following protective measures:

1. Existing landscape areas, streets, and parking lot areas that are outside the working perimeter of the project are to be protected from damage caused by construction.

2. Temporary protection against damage for portions of existing streets and parking lot areas where work is to be done, materials handled and equipment moved and/or relocated.

D. Final Cleanup:

1. Upon completion of project, or as work progresses, remove any unused materials and construction debris generated during construction.

1.8 NOT USED

1.9 NOT USED

1.10 PROTECTION OF EXISTING VEGETATION, STRUCTURES, EQUIPMENT, UTILITIES, AND IMPROVEMENTS

A. The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed and which do not unreasonably interfere with the work required under this contract. The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during contract performance, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer (COTR).

B. The Contractor shall protect from damage all existing improvements and utilities at or near the work site and on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. The Contractor shall repair any damage to those facilities, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

C. Refer to Section 01 57 19, TEMPORARY ENVIRONMENTAL CONTROLS, for additional requirements on protecting vegetation, soils and the environment. Refer to Articles, "Alterations", "Restoration", and "Operations and Storage Areas" for additional instructions concerning repair of damage to structures and site improvements.

1.11 RESTORATION

A. Remove, cut, alter, replace, patch and repair existing work as necessary to install new work. Except as otherwise shown or specified, do not cut, alter or remove any structural work, and do not disturb any ducts, plumbing, steam, gas, or electric work without approval of the Engineering Technician (COTR). Existing work to be altered or extended and that is found to be defective in any way, shall be reported to the Engineering Technician (COTR) before it is disturbed. Materials and workmanship used in restoring work, shall conform in type and quality to that of original existing construction, except as otherwise shown or specified.

B. Upon completion of contract, deliver work complete and undamaged. Existing work (walls, ceilings, partitions, floors, mechanical and electrical work, lawns, paving, roads, walks, etc.) disturbed or removed as a result of performing required new work, shall be patched, repaired, reinstalled, or replaced with new work, and refinished and left in as good condition as existed before commencing work.

C. At Contractor's own expense, Contractor shall immediately restore to service and repair any damage caused by Contractor's workmen to existing piping and conduits, wires, cables, etc., of utility services or of fire protection systems and communications systems (including telephone) which are indicated on drawings and which are not scheduled for discontinuance or abandonment.

D. Expense of repairs to such utilities and systems not shown on drawings or locations of which are unknown will be covered by adjustment to contract time and price in accordance with clause

entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) and "DIFFERING SITE CONDITIONS" (FAR 52.236-2) of Section 00 72 00, GENERAL CONDITIONS.

1.12 RECORD DRAWINGS

A. The contractor shall maintain two full size sets of Record drawings, which will be kept current during construction of the project, to include all contract changes, modifications and clarifications.

B. All variations shall be shown in the same general detail as used in the contract drawings. To insure compliance, Record drawings shall be made available for the Engineering Technician's review, as often as requested.

C. Contractor shall deliver two approved completed sets of Record drawings to the Engineering Technician (COTR) within 15 calendar days after each completed phase and after the acceptance of the project by the Government. Partial drawing sets will not be accepted.

D. Paragraphs A, B, & C shall also apply to all shop drawings.

1.13 USE OF ROADWAYS

A. For hauling, use only established public roads and roads on Medical Center property and, when authorized by the Engineering Technician (COTR), such temporary roads which are necessary in the performance of contract work. Temporary roads shall be constructed by the Contractor at Contractor's expense. When necessary to cross curbing, sidewalks, or similar construction, they must be protected by well-constructed bridges.

B. When new permanent roads are to be a part of this contract, Contractor may construct them immediately for use to facilitate building operations. These roads may be used by all who have business thereon within zone of building operations.

1.14 NOT USED

1.15 PROFESSIONAL SURVEYING SERVICES

A registered professional land surveyor or registered civil engineer shall perform services specified herein and in other specification sections. Contractor shall notify the engineer 48 hours in advance for scheduling of any survey staking.

1.16 TEMPORARY TOILETS

A. General Contractor shall provide, where directed, for use of all Construction workmen, ample temporary sanitary toilet accommodations with suitable sewer and water connections; or, when approved by Resident Engineer (COTR) provide suitable dry closets where directed. Keep such places clean and free from flies, and all connections and appliances connected therewith are to be removed prior to completion of the contract and the premises left perfectly clean and as found at the start of this work.

1.17 AVAILABILITY AND USE OF UTILITY SERVICES

A. The Government shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified herein. The amount to be paid by the Contractor for chargeable electrical services shall be the prevailing rates charged to the Government. The Contractor shall carefully conserve any utilities furnished without charge.

B. The Contractor, at Contractor's expense and in a workmanlike manner satisfactory to the Contracting Officer (COTR), shall install and maintain all necessary temporary connections and distribution lines, Before final acceptance of the work by the Government, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

C. Contractor shall install meters at Contractor's expense and furnish the Medical Center a monthly record of the Contractor's usage of electricity as hereinafter specified.

D. Electricity (for Construction and Testing): Furnish all temporary electric services.

1. Obtain electricity by connecting to the Medical Center electrical distribution system. The Contractor shall meter and pay for electricity required for electric cranes and hoisting devices, electrical welding devices and any electrical heating devices providing temporary heat. Electricity for all other uses is available at no cost to the Contractor.

E. Water (for Construction and Testing): General Contractor to coordinate for temporary water service.

1. Obtain water by connecting to the Medical Center water distribution system. Provide reduced pressure backflow preventer at each connection. Water is available at no cost to the Contractor.

2. Maintain connections, pipe, fittings and fixtures and conserve water-use so none is wasted. Failure to stop leakage or other wastes will be cause for revocation (at Engineering Technician (COTR) discretion) of use of water from Medical Center's system.

1.18 -1.28 NOT USED

1.29 CONSTRUCTION SIGN

A. Provide construction Signage per COTR instruction, where directed by the Engineering Technician (COTR), and or Safety Officer.

C. Maintain sign and remove it when directed by the Engineering Technician (COTR).

1.30 SAFETY SIGN

A. Provide Safety Signage per COTR instruction, where directed by Engineering Technician (COTR) and or VA Safety Officer.

C. Maintain sign and remove it when directed by Engineering Technician or VA Safety Officer.

1.31 CONSTRUCTION DIGITAL IMAGES

A. During the construction period through completion, furnish Department of Veterans Affairs with digital images, including one color print of each view and one Compact Disc (CD) per visit containing those views taken on that visit. Digital views shall be taken of exterior and/or interior as selected and directed by Engineering Technician (COTR) (RE). Each view shall be taken with a professional grade camera with minimum size of 6 megapixels (MP) and the images will be a minimum of 2272 x 1704 pixels for the 200x250mm (8x 10 inch) prints and 2592 x 1944 pixels for the 400x500 mm (16 x 20 inch) prints, as per these specifications:

1. Normally such images will be taken at monthly intervals. However, the Engineering Technician (COTR) may also direct the taking of special digital images at any time prior to completion and acceptance of contract. If the number of trips to the site exceeds an average of one per month of the contract performance period then an adjustment in contract price will be made in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) of Section 00 72 00, GENERAL CONDITIONS.

2. In event a greater or lesser number of images than specified above are required by the Engineering Technician (COTR), adjustment in contract price will be made in accordance with clause entitled "CHANGES" (FAR 52.243-4 and VAAR 852.236-88) of Section 00 72 00, GENERAL CONDITIONS.

B. Images shall show distinctly, at as large a scale as possible, all parts of work embraced in the picture.

C. Prints shall be made on 200 x 250 mm (8 by 10 inch) regular-weight matte archival grade photographic paper and produced by a process with a minimum of 300 pixels per inch (PPI). Prints must be printed using the commercial RA4 process (inkjet prints will not be acceptable). Photographs shall have 200 x 200 mm (8 by 8 inch) full picture print with no margin on three sides and a 50 mm (2 inches) margin on the bottom for pre-typed self-adhesive identity label to be added by Engineering Technician (COTR). It is required that the prints are professionally processed so the quality will meet or exceed that of the same size print made with a film camera. Prints must be shipped flat to the Engineering Technician (COTR):

E. Images on CD-ROM shall be recorded in JPEG format with a minimum of 48-bit color and no reduction in actual picture size. Compressed size of the file shall be no less than 80% or the original with no loss of information. File names shall contain the date the image was taken, the Project number and a unique sequential identifier. The CD-ROM shall also contain an index of all the images contained therein in either a TXT or Microsoft Word format.

F. In case any set of prints are not submitted within five days of date established by Engineering Technician for taking thereof, the Engineering Technician (COTR) may have such images/photographs taken and cost of same will be deducted from any money due to the Contractor.

E. Interior Final Photos: After completion of all work in an area final interior photos will be taken. The camera must allow the colors to be as close as possible to the actual colors. For number and location of views, see Section 09 06 00, SCHEDULE FOR FINISHES. View shall be taken after final completion of work. The images shall also be provided on a CD to the RE Office.

1.32 NOT USED

1.33 HISTORIC PRESERVATION

Where the Contractor or any of the Contractor's employees, prior to, or during the construction work, are advised of or discover any possible archeological, historical and/or cultural resources, the Contractor shall immediately notify the Engineering Technician verbally, and then with a written follow up.

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SPECIAL PROVISIONS

WORK TO BE DONE

The work to be done under this contract consists of the following for the Department of Veterans Affairs, Upgrade Street Lighting; Project No. 653-13-111.

1. Protect and maintain existing utilities that are to remain in service and are located either adjacent to or inside the perimeter of work area.
2. Furnish, place and maintain traffic control devices.
3. Furnish, place and maintain erosion control measures.
4. Remove existing light poles and bases.
5. Furnish and install lighting pole bases and decorative light poles.
6. Perform additional and incidental work as called for by the specifications and plans.

APPLICABLE SPECIFICATIONS

The Specifications, which are applicable to the work on this project, are:

- APWA/ODOT 2008 edition of the "Oregon Standard Specifications for Construction".

Bound copies of the book are available for purchase at Contractor Plans (Phone: 503-986-6936), or an order form can be downloaded for purchasing on the internet at :

http://www.oregon.gov/ODOT/HWY/SPECS/standard_specifications.shtml

All number references in these special provisions shall be understood to refer to the Sections and subsections of the Standard Specifications and Supplemental Standard Specifications bearing like numbers and to Sections and subsections contained herein in their entirety.

SECTION 00110 - TERMS, ABBREVIATIONS, AND DEFINITIONS

Comply with Section 00110 of the Standard Specifications supplemented and/or modified as follows:

00110.00 Meaning of Terms – Add the following after the last bullet:

- This is a Department of Veterans Affairs project. Substitute terms pertaining to:
  - Transportation Commission with VA
  - Engineer with Public Works Director or his authorized representatives

- Department with VA
- Other like terms with VA substitutes

SECTION 00140 - SCOPE OF WORK

Comply with Section 00140 of the Standard Specifications.

SECTION 00150 - CONTROL OF WORK

Comply with Section 00150 of the Standard Specifications supplemented and/or modified as follows:

00150.10 Coordination of Specifications and Plans – Add the following before the first bullet:

- VA General Contract Conditions govern over Standard Specifications Sections 00120, 00130,170, 180 and 195.

SECTION 00165 - QUALITY OF MATERIALS

Delete Section 00165 of the Standard Specifications and substitute the following:

00165.03 Testing by Agency – No testing will be performed by the VA. All testing shall be the responsibility of the Contractor.

00165.04 Cost of Testing – All testing required to be performed by the Contractor will be at the Contractor's expense.

00165.10 Material Acceptance - Delete this subsection and substitute the following:

00165.10 Contractor Quality Control:

(a) Responsibilities - Be responsible for:

- Furnishing material of the quality specified.
- Performing testing as required by the Special Provisions or Supplemental Standard Specifications.

00165.50(b-1) Specification Materials – delete 1.05 at the end and substitute 1.00 as there will be no PF greater than 1.00 on this project.

SECTION 00170 - LEGAL RELATIONS AND RESPONSIBILITIES

- Comply with Section 00170 of the Standard Specifications.

SECTION 00180 - PROSECUTION AND PROGRESS

Comply with Section 00180 of the Standard Specifications supplemented and/or modified as follows:

00180.40 Limitation of Operations - Add the following at the end of this subsection:

(c) Limitation of Operations - Limitation of operations specified in these special provisions include, but are not limited to the following:

Limitations	Subsection
• Utilities Work	00150.50
• Final completion time	00180.50
• Traffic Restrictions	00220.40

Be aware of and subject to schedule limitations in the Standard Specifications and supplemental Standard Specifications which are not listed in this subsection.

00180.41 Project Work Schedule - Add the following for work under this contract:

(a) Type "A" schedule - Submit project schedules as outlined under this section.

SECTION 00210 - MOBILIZATION

Perform mobilization according to Section 00210 of the Standard Specifications supplemented and/or modified as follows:

00210.00 Scope – Delete this section and substitute the following:

This work consists of operations and preparatory work necessary to become ready to perform the work or an item of work. A portion of this work shall be considered “Demobilization” and shall include but not limited to site cleanup including staging areas including the restoration and/or removal of debris, rubbish, unused materials, equipment and tools.

SECTION 00220 - ACCOMMODATIONS FOR PUBLIC TRAFFIC

Maintain public traffic through the project according to Section 00220 of the Standard Specifications.

SECTION 00225 - WORK ZONE TRAFFIC CONTROL

Provide work zone TCM conforming to Section 00225 of the Standard Specifications, supplemented and/or modified as follows:

00225.05 Contractor's Traffic Control Plan – Replace this subsection, except for the subsection number and title, with the following:

The Contractor will be allowed to use the Agency's TCP, modify the Agency's TCP, or use a different TCP. Submit the following, for approval, five calendar days before the preconstruction conference:

(a) Agency or Contractor TCP - If the Agency's TCP is used without modification, a written notification indicating that the Agency's TCP will be used without modification.

If the Contractor will be using a modified Agency TCP, or if the Contractor will not be using the Agency TCP, include the following:

- Proposed TCP showing all TCM and quantities of all TCD.
- Proposed order and duration of the TCM.

SECTION 00280 - EROSION AND SEDIMENT CONTROL

Comply with Section 00280 of the Standard Specifications modified as follows:

SECTION 00310 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Comply with Section 00310 of the Standard Specifications modified as follows:

Construction

00310.41 Removal Work:

(a) General - Replace this subsection, except for the subsection number and title, with the following:

Where an abutting structure or part of a structure is to be left in place, make clean, smooth, vertical cuts with a saw or other approved cutting device. Avoid operations that may damage any portion of the remaining structure.

SECTION 00320 - CLEARING AND GRUBBING

Perform clearing and grubbing according to Section 00320 of the Standard Specifications.

SECTION 00330 - EARTHWORK

Perform earthwork operations according to Section 00330 of the Standard Specifications.

SECTION 00405 - TRENCH EXCAVATION, BEDDING AND BACKFILL

Comply with Section 00370 of the Standard Specifications modified as follows:

00405.46 (c-1) Trench Backfill – General – Use Class E trench backfill, Controlled Low-Strength Material (CLSM) as backfill under all existing AC surfaces regardless if existing surface is to be overlayed or not. Use Class B trench backfill at all other locations.

(c-2) Class A, B, C, or D Backfill – Add the following

Provide copies of all tests to the engineer, including Density Curves, Coarse Particle Correction, and Density-in-place, etc. In place density tests shall be performed at a minimum of three tests per lift for every 300 feet of trench, or one test per pipe section if less than 100 feet in length, for every successive lift of trench backfill above the pipe bedding zone, with successive lifts not to exceed 12 inches. Contractor must demonstrate, by compaction testing or acceptable visual means, that the material, equipment and process used for compaction achieves the specification requirements. If the material, equipment or process changes, or if other conditions indicate a non-specification product, the Contractor must re-demonstrate the achievement of the specification requirements. The engineer may verify contractor testing.

SECTION 00440 - COMMERCIAL GRADE CONCRETE

Comply with Section 00440 of the Standard Specifications.

SECTION 00960 - COMMON PROVISIONS FOR ELECTRICAL SYSTEMS

Delete Section 00960 of the Standard Specifications, except as follows. Refer to the following VA Specification Section:

26 05 11 Requirements for Electrical Installation

00960.41(f) Disposition of Waste Materials - Replace this subsection with the following subsection:

00960.41(f) Disposal of Materials - Dispose of all materials according to 00290.20.

Measurement

00960.80 Measurement - There will be no measurement for this item.

Payment

00960.90 Payment - Payment for this item will be made on a “Lump Sum” basis for all work complete, as identified on the electrical drawings.

SECTION 02920 - COMMON ELECTRICAL MATERIALS

Delete Section 02920 of the Standard Specifications, except as follows. Refer to the following VA Specification Sections.

26 05 21 Low-Voltage Electrical Power Conductors and Cables
26 05 26 Grounding and Bonding for Electrical Systems
26 05 33 Raceway and Boxes for Electrical Systems
26 05 41 Underground Electrical Construction

Measurement

002920.80 Measurement - There will be no measurement for this item.

Payment

02920.90 Payment - Payment for this item will be made on a “Lump Sum” basis for all work complete, as identified on the electrical drawings.

SECTION 02926 – HIGHWAY ILLUMINATION MATERIALS

Delete Section 02926 of the Standard Specifications, except as follows. Refer to the following VA Specification Section.

26 56 00 Exterior Lighting

Measurement

002926.80 Measurement - There will be no measurement for this item.

Payment

02926.90 Payment - Payment for this item will be made on a “Lump Sum” basis for all work complete, as identified on the electrical drawings.

SECTION 26 05 11
REQUIREMENTS FOR ELECTRICAL INSTALLATIONS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section applies to all sections of Division 26.

B. Furnish and install electrical wiring, systems, equipment and accessories in accordance with the specifications and drawings. Capacities and ratings of motors, transformers, cable, switchboards, switchgear, panelboards, motor control centers, and other items and arrangements for the specified items are shown on drawings.

C. Electrical service entrance equipment (arrangements for temporary and permanent connections to the utility’s system) shall conform to the utility's requirements. Coordinate fuses, circuit breakers and relays with the utility’s system, and obtain utility approval for sizes and settings of these devices.

D. Wiring ampacities specified or shown on the drawings are based on copper conductors, with the conduit and raceways accordingly sized. Aluminum conductors are prohibited.

1.2 MINIMUM REQUIREMENTS

A. References to the International Building Code (IBC), National Electrical Code (NEC), Underwriters Laboratories, Inc. (UL) and National Fire Protection Association (NFPA) are minimum installation requirement standards.

B. Drawings and other specification sections shall govern in those instances where requirements are greater than those specified in the above standards.

1.3 TEST STANDARDS

A. All materials and equipment shall be listed, labeled or certified by a nationally recognized testing laboratory to meet Underwriters Laboratories, Inc., standards where test standards have been established. Equipment and materials which are not covered by UL Standards will be accepted provided equipment and material is listed, labeled, certified or otherwise determined to meet safety requirements of a nationally recognized testing laboratory. Equipment of a class which no nationally recognized testing laboratory accepts, certifies, lists, labels, or determines to be safe, will be considered if inspected or tested in accordance with national industrial standards, such as NEMA, or ANSI. Evidence of compliance shall include certified test reports and definitive shop drawings.

B. Definitions:

1. Listed; Equipment, materials, or services included in a list published by an organization that is acceptable to the authority having jurisdiction and concerned with evaluation of products or services, that maintains periodic inspection of production or listed equipment or materials or periodic evaluation of services, and whose listing states that the equipment, material, or services either meets appropriate designated standards or has been tested and found suitable for a specified purpose.
2. Labeled; Equipment or materials to which has been attached a label, symbol, or other identifying mark of an organization that is acceptable to the authority having jurisdiction and concerned with product evaluation, that maintains periodic inspection of production of labeled equipment or materials, and by whose labeling the manufacturer indicates compliance with appropriate standards or performance in a specified manner.
3. Certified; equipment or product which:
   a. Has been tested and found by a nationally recognized testing laboratory to meet nationally recognized standards or to be safe for use in a specified manner.
   b. Production of equipment or product is periodically inspected by a nationally recognized testing laboratory.
   c. Bears a label, tag, or other record of certification.
4. Nationally recognized testing laboratory; laboratory which is approved, in accordance with OSHA regulations, by the Secretary of Labor.

1.4 QUALIFICATIONS (PRODUCTS AND SERVICES)

A. Manufacturers Qualifications: The manufacturer shall regularly and presently produce, as one of the manufacturer's principal products, the equipment and material specified for this project, and shall have manufactured the item for at least three years.

B. Product Qualification:

1. Manufacturer's product shall have been in satisfactory operation, on three installations of similar size and type as this project, for approximately three years.
2. The Government reserves the right to require the Contractor to submit a list of installations where the products have been in operation before approval.

C. Service Qualifications: There shall be a permanent service organization maintained or trained by the manufacturer which will render satisfactory service to this installation within four hours of receipt of

notification that service is needed. Submit name and address of service organizations.

1.5 APPLICABLE PUBLICATIONS

Applicable publications listed in all Sections of Division are the latest issue, unless otherwise noted.

1.6 MANUFACTURED PRODUCTS

A. Materials and equipment furnished shall be of current production by manufacturers regularly engaged in the manufacture of such items, for which replacement parts shall be available.

B. When more than one unit of the same class or type of equipment is required, such units shall be the product of a single manufacturer.

C. Equipment Assemblies and Components:

1. Components of an assembled unit need not be products of the same manufacturer.
2. Manufacturers of equipment assemblies, which include components made by others, shall assume complete responsibility for the final assembled unit.
3. Components shall be compatible with each other and with the total assembly for the intended service.
4. Constituent parts which are similar shall be the product of a single manufacturer.

D. Factory wiring shall be identified on the equipment being furnished and on all wiring diagrams.

E. When Factory Testing Is Specified:

1. The Government shall have the option of witnessing factory tests. The contractor shall notify the VA through the Resident Engineer a minimum of 15 working days prior to the manufacturers making the factory tests.
2. Four copies of certified test reports containing all test data shall be furnished to the Resident Engineer prior to final inspection and not more than 90 days after completion of the tests.
3. When equipment fails to meet factory test and re-inspection is required, the contractor shall be liable for all additional expenses, including expenses of the Government.

1.7 EQUIPMENT REQUIREMENTS

Where variations from the contract requirements are requested in accordance with Section 00 72 00, GENERAL CONDITIONS and Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, the connecting work and related components shall include, but not be limited to additions or changes to branch circuits, circuit protective devices, conduits, wire, feeders, controls, panels and installation methods.

1.8 EQUIPMENT PROTECTION

A. Equipment and materials shall be protected during shipment and storage against physical damage, vermin, dirt, corrosive substances, fumes, moisture, cold and rain.
   1. Store equipment indoors in clean dry space with uniform temperature to prevent condensation. Equipment shall include but not be limited to switchgear, switchboards, panelboards, transformers, motor control centers, motor controllers, uninterruptible power systems, enclosures, controllers, circuit protective devices, cables, wire, light fixtures, electronic equipment, and accessories.
   2. During installation, equipment shall be protected against entry of foreign matter; and be vacuum-cleaned both inside and outside before testing and operating. Compressed air shall not be used to clean equipment. Remove loose packing and flammable materials from inside equipment.
   3. Damaged equipment shall be, as determined by the Resident Engineer, placed in first class operating condition or be returned to the source of supply for repair or replacement.
   4. Painted surfaces shall be protected with factory installed removable heavy kraft paper, sheet vinyl or equal.
   5. Damaged paint on equipment and materials shall be refinished with the same quality of paint and workmanship as used by the manufacturer so repaired areas are not obvious.

1.9 WORK PERFORMANCE

A. All electrical work must comply with the requirements of NFPA 70 (NEC), NFPA 70B, NFPA 70E, OSHA Part 1910 subpart J, OSHA Part 1910 subpart S and OSHA Part 1910 subpart K in addition to other references required by contract.

B. Job site safety and worker safety is the responsibility of the contractor.

C. Electrical work shall be accomplished with all affected circuits or equipment de-energized. When an electrical outage cannot be accomplished in this manner for the required work, the following requirements are mandatory:
   1. Electricians must use full protective equipment (i.e., certified and tested insulating material to cover exposed energized electrical components, certified and tested insulated tools, etc.) while working on energized systems in accordance with NFPA 70E.
   2. Electricians must wear personal protective equipment while working on energized systems in accordance with NFPA 70E.

3. Before initiating any work, a job specific work plan must be developed by the contractor with a peer review conducted and documented by the Resident Engineer and Medical Center staff. The work plan must include procedures to be used on and near the live electrical equipment, barriers to be installed, safety equipment to be used and exit pathways.
4. Work on energized circuits or equipment cannot begin until prior written approval is obtained from the Resident Engineer.

D. For work on existing stations, arrange, phase and perform work to assure electrical service for other buildings at all times. Refer to Article OPERATIONS AND STORAGE AREAS under Section 01 00 00, GENERAL REQUIREMENTS.

E. New work shall be installed and connected to existing work neatly, safely and professionally. Disturbed or damaged work shall be replaced or repaired to its prior conditions, as required by Section 01 00 00, GENERAL REQUIREMENTS.

F. Coordinate location of equipment and conduit with other trades to minimize interferences.

1.10 EQUIPMENT INSTALLATION AND REQUIREMENTS

A. Equipment location shall be as close as practical to locations shown on the drawings.

B. Working spaces shall not be less than specified in the NEC for all voltages specified.

C. Inaccessible Equipment:

1. Where the Government determines that the Contractor has installed equipment not conveniently accessible for operation and maintenance, the equipment shall be removed and reinstalled as directed at no additional cost to the Government.
2. "Conveniently accessible" is defined as being capable of being reached quickly for operation, maintenance, or inspections without the use of ladders, or without climbing or crawling under or over obstacles such as, but not limited to, motors, pumps, belt guards, transformers, piping, ductwork, conduit and raceways.

1.11 EQUIPMENT IDENTIFICATION

A. In addition to the requirements of the NEC, install an identification sign which clearly indicates information required for use and maintenance of items such as panelboards, cabinets, motor controllers (starters), safety switches, separately enclosed circuit breakers, individual breakers and controllers in switchboards, switchgear and motor control assemblies, control devices and other significant equipment.

B. Nameplates for Normal Power System equipment shall be laminated black phenolic resin with a white core with engraved lettering. Nameplates for Essential Electrical System (EES) equipment, as defined in the NEC, shall be laminated red phenolic resin with a white core with engraved lettering. Lettering shall be a minimum of 1/2 inch [12mm] high. Nameplates shall indicate equipment designation, rated bus amperage, voltage, number of phases, number of wires, and type of EES power branch as applicable. Secure nameplates with screws.

1.12 SUBMITTALS

A. Submit in accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.

B. The Government's approval shall be obtained for all equipment and material before delivery to the job site. Delivery, storage or installation of equipment or material which has not had prior approval will not be permitted at the job site.

C. All submittals shall include adequate descriptive literature, catalog cuts, shop drawings and other data necessary for the Government to ascertain that the proposed equipment and materials comply with specification requirements. Catalog cuts submitted for approval shall be legible and clearly identify equipment being submitted.

D. Submittals for individual systems and equipment assemblies which consist of more than one item or component shall be made for the system or assembly as a whole. Partial submittals will not be considered for approval.

1. Mark the submittals, "SUBMITTED UNDER SECTION_____".
2. Submittals shall be marked to show specification reference including the section and paragraph numbers.
3. Submit each section separately.

E. The submittals shall include the following:

1. Information that confirms compliance with contract requirements. Include the manufacturer's name, model or catalog numbers, catalog information, technical data sheets, shop drawings, pictures, nameplate data and test reports as required.
2. Elementary and interconnection wiring diagrams for communication and signal systems, control systems and equipment assemblies. All terminal points and wiring shall be identified on wiring diagrams.
3. Parts list which shall include those replacement parts recommended by the equipment manufacturer.

F. Manuals: Submit in accordance with Section 01 00 00, GENERAL REQUIREMENTS.
   1. Maintenance and Operation Manuals: Submit as required for systems and equipment specified in the technical sections. Furnish four copies, bound in hardback binders, (manufacturer's standard binders) or an approved equivalent. Furnish one complete manual as specified in the technical section but in no case later than prior to performance of systems or equipment test, and furnish the remaining manuals prior to contract completion.
   2. Inscribe the following identification on the cover: the words "MAINTENANCE AND OPERATION MANUAL," the name and location of the system, equipment, building, name of Contractor, and contract number. Include in the manual the names, addresses, and telephone numbers of each subcontractor installing the system or equipment and the local representatives for the system or equipment.
   3. Provide a "Table of Contents" and assemble the manual to conform to the table of contents, with tab sheets placed before instructions covering the subject. The instructions shall be legible and easily read, with large sheets of drawings folded in.
   4. The manuals shall include:
      a. Internal and interconnecting wiring and control diagrams with data to explain detailed operation and control of the equipment.
      b. A control sequence describing start-up, operation, and shutdown.
      c. Description of the function of each principal item of equipment.
      d. Installation instructions.
      e. Safety precautions for operation and maintenance.
      f. Diagrams and illustrations.
      g. Periodic maintenance and testing procedures and frequencies, including replacement parts numbers and replacement frequencies.
      h. Performance data.
      i. Pictorial "exploded" parts list with part numbers. Emphasis shall be placed on the use of special tools and instruments. The list shall indicate sources of supply, recommended spare parts, and name of servicing organization.
      j. List of factory approved or qualified permanent servicing organizations for equipment repair and periodic testing and maintenance, including addresses and factory certification qualifications.

G. Approvals will be based on complete submission of manuals together with shop drawings.

H. After approval and prior to installation, furnish the Resident Engineer with one sample of each of the following:
   1. A 300 mm (12 inch) length of each type and size of wire and cable along with the tag from the coils of reels from which the samples were taken.
   2. Each type of conduit coupling, bushing and termination fitting.
   3. Conduit hangers, clamps and supports.
   4. Duct sealing compound.
   5. Each type of receptacle, toggle switch, occupancy sensor, outlet box, manual motor starter, device wall plate, engraved nameplate, wire and cable splicing and terminating material, and branch circuit single pole molded case circuit breaker.

1.13 SINGULAR NUMBER

Where any device or part of equipment is referred to in these specifications in the singular number (e.g., "the switch"), this reference shall be deemed to apply to as many such devices as are required to complete the installation as shown on the drawings.

1.14 ACCEPTANCE CHECKS AND TESTS

The contractor shall furnish the instruments, materials and labor for field tests.

1.15 TRAINING

A. Training shall be provided in accordance with Article 5, INSTRUCTIONS, of Section 01 00 00, GENERAL REQUIREMENTS.

B. Training shall be provided for the particular equipment or system as required in each associated specification.

C. A training schedule shall be developed and submitted by the contractor and approved by the Resident Engineer at least 30 days prior to the planned training.

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SECTION 26 05 21
LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW)

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies the furnishing, installation, and connection of the low voltage power and lighting wiring.

1.2 RELATED WORK

A. Excavation and backfill for cables that are installed in conduit: Section 00405 – Trench Excavation, Bedding and Backfill.

B. Sealing around penetrations to maintain the integrity of time rated construction: Section 07 84 00, FIRESTOPPING.

C. General electrical requirements that are common to more than one section in Division 26: Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

D. Conduits for cables and wiring: Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS.

E. Requirements for personnel safety and to provide a low impedance path for possible ground fault currents: Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

1.3 SUBMITTALS

A. In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:

1. Manufacturer's Literature and Data: Showing each cable type and rating.
2. Certificates: Two weeks prior to final inspection, deliver to the Resident Engineer four copies of the certification that the material is in accordance with the drawings and specifications and has been properly installed.

1.4 APPLICABLE PUBLICATIONS

Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. Publications are reference in the text by the basic designation only.

A. American Society of Testing Material (ASTM):

D2301-04.....Standard Specification for Vinyl Chloride Plastic Pressure Sensitive Electrical Insulating Tape

B. Federal Specifications (Fed. Spec.):

A-A-59544-00.....Cable and Wire, Electrical (Power, Fixed Installation)

C. National Fire Protection Association (NFPA):

70-05.....National Electrical Code (NEC)

D. Underwriters Laboratories, Inc. (UL):

44-02.....Thermoset-Insulated Wires and Cables
83-03.....Thermoplastic-Insulated Wires and Cables
467-01.....Electrical Grounding and Bonding Equipment
486A-01.....Wire Connectors and Soldering Lugs for Use with Copper Conductors
486C-02.....Splicing Wire Connectors
486D-02.....Insulated Wire Connector Systems for Underground Use or in Damp or Wet Locations
486E-00.....Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors
493-01.....Thermoplastic-Insulated Underground Feeder and Branch Circuit Cable
514B-02.....Fittings for Cable and Conduit
1479-03.....Fire Tests of Through-Penetration Fire Stops

PART 2 - PRODUCTS

2.1 CABLE AND WIRE (POWER AND LIGHTING)

A. Cable and Wire shall be in accordance with Fed. Spec. A-A-59544, except as hereinafter specified.

B. Single Conductor:

1. Shall be annealed copper.
2. Shall be stranded for sizes No. 8 AWG and larger, solid for sizes No. 10 AWG and smaller.
3. Shall be minimum size No. 12 AWG, except where smaller sizes are allowed herein.

C. Insulation:

1. THW, XHHW, or dual rated THHN-THWN shall be in accordance with UL 44, and 83.
2. Direct burial: UF or USE shall be in accordance with UL 493.
3. Isolated power system wiring: Type XHHW with a dielectric constant of 3.5 or less.

D. Color Code:

1. Secondary service, feeder and branch circuit conductors shall be color coded as follows:

208/120 volt	Phase	480/277 volt
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray *
* or white with colored (other than green) tracer.		

a. The lighting circuit “switch legs” and 3-way switch “traveling wires” shall have color coding unique and distinct (i.e. pink and purple) from the color coding indicated above. The unique color codes shall be solid and in accordance with the NEC. Field coordinate for a final color coding with the Resident Engineer.

2. Use solid color compound or solid color coating for No. 12 AWG and No. 10 AWG branch circuit conductors and neutral sizes.
3. Phase conductors No. 8 AWG and larger shall be color-coded using one of the following methods:
   a. Solid color compound or solid color coating.
   b. Stripes, bands, or hash marks of color specified above.
   c. Color as specified using 19 mm (3/4 inch) wide tape. Apply tape in half overlapping turns for a minimum of 75 mm (three inches) for terminal points, and in junction boxes, pull boxes, troughs, manholes, and handholes. Apply the last two laps of tape with no tension to prevent possible unwinding. Where cable markings are covered by tape, apply tags to cable stating size and insulation type.
4. For modifications and additions to existing wiring systems, color coding shall conform to the existing wiring system.
5. Color code for isolated power system wiring shall be in accordance with the NEC.

2.2 SPLICES AND JOINTS

A. In accordance with UL 486A, C, D, E and NEC.

B. Branch circuits (No. 10 AWG and smaller):
   1. Connectors: Solderless, screw-on, reusable pressure cable type, 600 volt, 105 degree C with integral insulation, approved for copper and aluminum conductors.
   2. The integral insulator shall have a skirt to completely cover the stripped wires.
   3. The number, size, and combination of conductors, as listed on the manufacturers packaging shall be strictly complied with.

C. Feeder Circuits:
   1. Connectors shall be indent, hex screw, or bolt clamp-type of high conductivity and corrosion-resistant material.
   2. Field installed compression connectors for cable sizes 250 kcmil and larger shall have not less than two clamping elements or compression indents per wire.

3. Insulate splices and joints with materials approved for the particular use, location, voltage, and temperature. Insulate with not less than that of the conductor level that is being joined.
4. Plastic electrical insulating tape: ASTM D2304 shall apply, flame retardant, cold and weather resistant.

2.3 CONTROL WIRING

A. Unless otherwise specified in other sections of these specifications, control wiring shall be as specified for power and lighting wiring, except the minimum size shall be not less than No. 14 AWG.
B. Control wiring shall be large enough so that the voltage drop under inrush conditions does not adversely affect operation of the controls.

2.4 WIRE LUBRICATING COMPOUND

A. Suitable for the wire insulation and conduit it is used with, and shall not harden or become adhesive.
B. Shall not be used on wire for isolated type electrical power systems.

2.5 FIREPROOFING TAPE

A. The tape shall consist of a flexible, conformable fabric of organic composition coated one side with flame-retardant elastomer.
B. The tape shall be self-extinguishing and shall not support combustion. It shall be arc-proof and fireproof.
C. The tape shall not deteriorate when subjected to water, gases, salt water, sewage, or fungus and be resistant to sunlight and ultraviolet light.
D. The finished application shall withstand a 200-ampere arc for not less than 30 seconds.
E. Securing tape: Glass cloth electrical tape not less than 0.18 mm (7 mils) thick, and 19 mm (3/4 inch) wide.

2.6 WARNING TAPE

A. The tape shall be standard, 76 mm (3 inch) wide, 4-Mil polyethylene detectable type.
B. The tape shall be red with black letters indicating “CAUTION BURIED ELECTRIC LINE BELOW”.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Install in accordance with the NEC, and as specified.
B. Install all wiring in raceway systems, except where direct burial or HCF Type AC cables are used.
C. Splice cables and wires only in outlet boxes, junction boxes, pull boxes, manholes, or handholes.

D. Wires of different systems (i.e. 120V, 277V) shall not be installed in the same conduit or junction box system.
E. Install cable supports for all vertical feeders in accordance with the NEC. Provide split wedge type which firmly clamps each individual cable and tightens due to cable weight.
F. For panelboards, cabinets, wireways, switches, and equipment assemblies, neatly form, train, and tie the cables in individual circuits.
G. Seal cable and wire entering a building from underground, between the wire and conduit where the cable exits the conduit, with a non-hardening approved compound.
H. Wire Pulling:
   1. Provide installation equipment that will prevent the cutting or abrasion of insulation during pulling of cables.
   2. Use ropes made of nonmetallic material for pulling feeders.
   3. Attach pulling lines for feeders by means of either woven basket grips or pulling eyes attached directly to the conductors, as approved by the Resident Engineer.
   4. Pull in multiple cables together in a single conduit.
I. No more than (3) single-phase branch circuits shall be installed in any one conduit.
J. The wires shall be derated in accordance with NEC Article 310. Neutral wires, under conditions defined by the NEC, shall be considered current-carrying conductors.

3.2 INSTALLATION IN MANHOLES

Install and support cables in manholes on the steel racks with porcelain or equal insulators. Train the cables around the manhole walls, but do not bend to a radius less than six times the overall cable diameter.

3.3 SPLICE INSTALLATION

A. Splices and terminations shall be mechanically and electrically secure.
B. Where the Government determines that unsatisfactory splices or terminations have been installed, remove the devices and install approved devices at no additional cost to the Government.

3.4 CONTROL AND SIGNAL WIRING INSTALLATION

A. Unless otherwise specified in other sections, install wiring and connect to equipment/devices to perform the required functions as shown and specified.
B. Except where otherwise required, install a separate power supply circuit for each system so that malfunctions in any system will not affect other systems.

C. Where separate power supply circuits are not shown, connect the systems to the nearest panelboards of suitable voltages, which are intended to supply such systems and have suitable spare circuit breakers or space for installation.

D. Install a red warning indicator on the handle of the branch circuit breaker for the power supply circuit for each system to prevent accidental de-energizing of the systems.

E. System voltages shall be 120 volts or lower where shown on the drawings or as required by the NEC.

3.5 CONTROL AND SIGNAL SYSTEM IDENTIFICATION

A. Install a permanent wire marker on each wire at each termination.

B. Identifying numbers and letters on the wire markers shall correspond to those on the wiring diagrams used for installing the systems.

C. Wire markers shall retain their markings after cleaning.

D. In each manhole and handhole, install embossed brass tags to identify the system served and function.

3.6 FEEDER IDENTIFICATION

A. In each interior pulbox and junction box, install metal tags on each circuit cables and wires to clearly designate their circuit identification and voltage.

B. In each manhole and handhole, provide tags of the embossed brass type, showing the cable type and voltage rating. Attach the tags to the cables with slip-free plastic cable lacing units.

3.7 DIRECT BURIAL CABLE INSTALLATION

A. Tops of the cables:

1. Below the finished grade: Minimum 600 mm (24 inches) unless greater depth is shown.
2. Below road and other pavement surfaces: In conduit as specified, minimum 750 mm (30 inches) unless greater depth is shown.
3. Do not install them under railroad tracks.

B. Under road and paved surfaces: Install cables in concrete encased galvanized steel rigid conduits. Size as shown on plans, but not less than 50 mm (two inch) trade size with bushings at each end of each conduit run. Provide size/quantity of conduits required to accommodate cables plus one spare.

C. Work with extreme care near existing ducts, conduits, cables and other utilities to prevent any damage.

D. Cut the trenches neatly and uniformly:
   1. Excavating and backfilling is specified in Section 00405 – TRENCH EXCAVATING, BEDDING AND BACKFILL.
   2. Place a 75 mm (3 inch) layer of sand in the trenches before installing the cables.
   3. Place a 75 mm (three inch) layer of sand over the installed cables.
   4. Install continuous horizontal, 25 mm by 200 mm (1 inch by 8 inch) preservative impregnated wood planking 75 mm (three inches) above the cables before backfilling.
E. Provide horizontal slack in the cables for contraction during cold weather.
F. Install the cables in continuous lengths. Splices within cable runs will not be accepted.
G. Connections and terminations shall be submersible type designed for the cables being installed.
H. Warning tape shall be continuously placed 300 mm (12 inches) above the buried cables.

3.8 EXISTNG WIRING

Unless specifically indicated on the plans, existing wiring shall not be reused for the new installation. Only wiring that conforms to the specifications and applicable codes may be reused. If existing wiring does not meet these requirements, existing wiring may not be reused and new wires shall be installed.

3.9 FIELD TESTING

A. Feeders and branch circuits shall have their insulation tested after installation and before connection to utilization devices such as fixtures, motors, or appliances.
B. Tests shall be performed by megger and conductors shall test free from short-circuits and grounds.
C. Test conductor phase-to-phase and phase-to-ground.
D. The Contractor shall furnish the instruments, materials, and labor for these tests.

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SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies general grounding and bonding requirements of electrical equipment operations and to provide a low impedance path for possible ground fault currents.

B. “Grounding electrode system” refers to all electrodes required by NEC, as well as including made, supplementary, lightning protection system grounding electrodes.

C. The terms “connect” and “bond” are used interchangeably in this specification and have the same meaning.

1.2 RELATED WORK

A. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements and items that are common to more than one section of Division 26.

B. Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Low Voltage power and lighting wiring.

C. Section 26 41 00, FACILITY LIGHTNING PROTECTION: Requirements for a lightning protection system.

1.3 SUBMITTALS

A. Submit in accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

B. Shop Drawings:

1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
2. Include the location of system grounding electrode connections and the routing of aboveground and underground grounding electrode conductors.

C. Test Reports: Provide certified test reports of ground resistance.

D. Certifications: Two weeks prior to final inspection, submit four copies of the following to the Resident Engineer:

1. Certification that the materials and installation is in accordance with the drawings and specifications.
2. Certification, by the Contractor, that the complete installation has been properly installed and tested.

1.4 APPLICABLE PUBLICATIONS

Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

A. American Society for Testing and Materials (ASTM):

B1-2001.....Standard Specification for Hard-Drawn Copper Wire

B8-2004.....Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft

B. Institute of Electrical and Electronics Engineers, Inc. (IEEE):

81-1983.....IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

C. National Fire Protection Association (NFPA):

70-2005.....National Electrical Code (NEC)

99-2005.....Health Care Facilities

D. Underwriters Laboratories, Inc. (UL):

44-2005 .....Thermoset-Insulated Wires and Cables

83-2003 .....Thermoplastic-Insulated Wires and Cables

467-2004 .....Grounding and Bonding Equipment

486A-486B-2003 .....Wire Connectors

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING CONDUCTORS

A. Equipment grounding conductors shall be UL 83 insulated stranded copper, except that sizes 6 mm² (10 AWG) and smaller shall be solid copper. Insulation color shall be continuous green for all equipment grounding conductors, except that wire sizes 25 mm² (4 AWG) and larger shall be permitted to be identified per NEC.

B. Bonding conductors shall be ASTM B8 bare stranded copper, except that sizes 6 mm² (10 AWG) and smaller shall be ASTM B1 solid bare copper wire.

C. Isolated Power System: Type XHHW-2 insulation with a dielectric constant of 3.5 or less.

D. Electrical System Grounding: Conductor sizes shall not be less than what is shown on the drawings and not less than required by the NEC, whichever is greater.

2.2 GROUND RODS

A. Copper clad steel, 19 mm (3/4-inch) diameter by 3000 mm (10 feet) long, conforming to UL 467.

B. Quantity of rods shall be as required to obtain the specified ground resistance.

2.3 SPLICES AND TERMINATION COMPONENTS

Components shall meet or exceed UL 467 and be clearly marked with the manufacturer, catalog number, and permitted conductor size(s).

2.4 GROUND CONNECTIONS

A. Below Grade: Exothermic-welded type connectors.

B. Above Grade:

1. Bonding Jumpers: compression type connectors, using zinc-plated fasteners and external tooth lockwashers.
2. Ground Busbars: Two-hole compression type lugs using tin-plated copper or copper alloy bolts and nuts.
3. Rack and Cabinet Ground Bars: one-hole compression-type lugs using zinc-plated or copper alloy fasteners.

2.5 EQUIPMENT RACK AND CABINET GROUND BARS

Provide solid copper ground bars designed for mounting on the framework of open or cabinet-enclosed equipment racks with minimum dimensions of 4 mm thick by 19 mm wide (3/8 inch x ¾ inch).

2.6 GROUND TERMINAL BLOCKS

At any equipment mounting location (e.g. backboards and hinged cover enclosures) where rack-type ground bars cannot be mounted, provide screw lug-type terminal blocks.

2.7 SPLICE CASE GROUND ACCESSORIES

Splice case grounding and bonding accessories shall be supplied by the splice case manufacturer when available. Otherwise, use 16 mm^2 (6 AWG) insulated ground wire with shield bonding connectors.

PART 3 - EXECUTION

3.1 GENERAL

A. Ground in accordance with the NEC, as shown on drawings, and as hereinafter specified.

B. System Grounding:

1. Secondary service neutrals: Ground at the supply side of the secondary disconnecting means and at the related transformers.
2. Separately derived systems (transformers downstream from the service entrance): Ground the secondary neutral.
3. Isolation transformers and isolated power systems shall not be system grounded.

C. Equipment Grounding: Metallic structures (including ductwork and building steel), enclosures, raceways, junction boxes, outlet boxes, cabinets, machine frames, and other conductive items in close proximity with electrical circuits shall be bonded and grounded.

D. Special Grounding: For patient care area electrical power system grounding, conform to NFPA 99, and NEC.

3.2 INACCESSIBLE GROUNDING CONNECTIONS

Make grounding connections, which are buried or otherwise normally inaccessible (except connections for which periodic testing access is required) by exothermic weld.

3.3 MEDIUM-VOLTAGE EQUIPMENT AND CIRCUITS

A. Switchgear: Provide a bare grounding electrode conductor from the switchgear ground bus to the grounding electrode system.

B. Duct Banks and Manholes: Provide an insulated equipment grounding conductor in each duct containing medium or high voltage conductors, sized per NEC except that minimum size shall be 25 mm² (2 AWG). Bond the equipment grounding conductors to the switchgear ground bus, to all manhole hardware and ground rods, to the cable shielding grounding provisions of medium or high voltage cable splices and terminations, and equipment enclosures.

C. Pad Mounted Transformers:

1. Provide a driven ground rod and bond with a grounding electrode conductor to the transformer grounding pad metal steel.
2. Ground the secondary neutral.

D. Lightning Arresters: Connect lightning arresters to the equipment ground bus or ground rods as applicable.

E. Outdoor Metallic Fences Around Electrical Equipment: // Fences shall be grounded as indicated. // //Fences shall be grounded with a ground rod at each fixed gate post and at each corner post. // Drive ground rods until the top is 300 mm (12 inches) below grade. Attach a 25 mm² (4 AWG) copper conductor, by exothermic weld to the ground rods and extend underground to the immediate vicinity of fence post. Lace the conductor vertically into 300 mm (12 inches) of fence mesh and fasten by two approved bronze compression fittings, one to bond wire to post and the other to bond wire to fence. Each gate section shall be bonded to its gatepost by a 3 by 25 mm (1/8 by one inch) flexible braided copper strap and ground post clamps. Clamps shall be of the anti-electrolysis type.

F. Metallic Conduit: Metallic conduits which terminate without mechanical connection to an electrical equipment housing by means of locknut and bushings or adapters, shall be provided with grounding bushings. Connect bushings with a bare grounding conductor to the equipment ground bus.

3.4 SECONDARY EQUIPMENT AND CIRCUITS

A. Main Bonding Jumper: Bond the secondary service neutral to the ground bus in the service equipment.

B. Metallic Piping, Building Steel, and Supplemental Electrode(s):
   1. Provide a grounding electrode conductor sized per NEC between the service equipment ground bus and all metallic water and gas pipe systems, building steel, and supplemental or made electrodes. Jumper insulating joints in the metallic piping. All connections to electrodes shall be made with fittings that conform to UL 467.
   2. Provide a supplemental ground electrode and bond to the grounding electrode system.

C. Service Disconnect (Separate Individual Enclosure): Provide a ground bar bolted to the enclosure with lugs for connecting the various grounding conductors.

D. Switchgear, Switchboards, Unit Substations, and Motor Control Centers:
   1. Connect the various feeder equipment grounding conductors to the ground bus in the enclosure with suitable pressure connectors.
   2. For service entrance equipment, connect the grounding electrode conductor to the ground bus.
   3. Connect metallic conduits, which terminate without mechanical connection to the housing, by grounding bushings and grounding conductor to the equipment ground bus.

E. Transformers:
   1. Exterior: Exterior transformers supplying interior service equipment shall have the neutral grounded at the transformer secondary. Provide a grounding electrode at the transformer.
   2. Separately derived systems (transformers downstream from service equipment): Ground the secondary neutral at the transformer. Provide a grounding electrode conductor from the transformer to // the nearest component of the grounding electrode system // // the ground bar at the service equipment //.

F. Conduit Systems:
   1. Ground all metallic conduit systems. All metallic conduit systems shall contain an equipment grounding conductor.
   2. Non-metallic conduit systems shall contain an equipment grounding conductor, except that non-metallic feeder conduits which carry a grounded conductor from exterior transformers to interior or building-mounted service entrance equipment need not contain an equipment grounding conductor.

3. Conduit containing only a grounding conductor, and which is provided for mechanical protection of the conductor, shall be bonded to that conductor at the entrance and exit from the conduit.

G. Feeders and Branch Circuits: Install equipment grounding conductors with all feeders and power and lighting branch circuits.

H. Boxes, Cabinets, Enclosures, and Panelboards:
1. Bond the equipment grounding conductor to each pullbox, junction box, outlet box, device box, cabinets, and other enclosures through which the conductor passes (except for special grounding systems for intensive care units and other critical units shown).
2. Provide lugs in each box and enclosure for equipment grounding conductor termination.
3. Provide ground bars in panelboards, bolted to the housing, with sufficient lugs to terminate the equipment grounding conductors.

I. Motors and Starters: Provide lugs in motor terminal box and starter housing or motor control center compartment to terminate equipment grounding conductors.

J. Receptacles shall not be grounded through their mounting screws. Ground with a jumper from the receptacle green ground terminal to the device box ground screw and the branch circuit equipment grounding conductor.

K. Ground lighting fixtures to the equipment grounding conductor of the wiring system when the green ground is provided; otherwise, ground the fixtures through the conduit systems. Fixtures connected with flexible conduit shall have a green ground wire included with the power wires from the fixture through the flexible conduit to the first outlet box.

L. Fixed electrical appliances and equipment shall be provided with a ground lug for termination of the equipment grounding conductor.

M. Raised Floors: Provide bonding of all raised floor components. //See details on the drawings. //

N. Panelboard Bonding: The equipment grounding terminal buses of the normal and essential branch circuit panelboards serving the same individual patient vicinity shall be bonded together with an insulated continuous copper conductor not less than 16 mm² (10 AWG). These conductors shall be installed in rigid metal conduit.

3.5 CORROSION INHIBITORS

When making ground and ground bonding connections, apply a corrosion inhibitor to all contact surfaces. Use corrosion inhibitor appropriate for protecting a connection between the metals used.

3.6 CONDUCTIVE PIPING

A. Bond all conductive piping systems, interior and exterior, to the building to the grounding electrode system. Bonding connections shall be made as close as practical to the equipment ground bus.

B. In operating rooms and at intensive care and coronary care type beds, bond the gases and suction piping, at the outlets, directly to the room or patient ground bus.

3.7 LIGHTNING PROTECTION SYSTEM

Bond the lightning protection system to the electrical grounding electrode system.

3.8 ELECTRICAL ROOM GROUNDING

Building Earth Ground Busbars: Provide ground busbar hardware at each electrical room and connect to pigtail extensions of the building grounding ring.

3.9 WIREWAY GROUNDING

A. Ground and Bond Metallic Wireway Systems as follows:

1. Bond the metallic structures of wireway to provide 100 percent electrical continuity throughout the wireway system by connecting a 16 mm² (6 AWG) bonding jumper at all intermediate metallic enclosures and across all section junctions.
2. Install insulated 16 mm² (6 AWG) bonding jumpers between the wireway system bonded as required in paragraph 1 above, and the closest building ground at each end and approximately every 16 meters (50 feet).
3. Use insulated 16 mm² (6 AWG) bonding jumpers to ground or bond metallic wireway at each end at all intermediate metallic enclosures and cross all section junctions.
4. Use insulated 16 mm² (6 AWG) bonding jumpers to ground cable tray to column-mounted building ground plates (pads) at each end and approximately every 15 meters.

3.10 GROUND RESISTANCE

A. Grounding system resistance to ground shall not exceed 5 ohms. Make necessary modifications or additions to the grounding electrode system for compliance without additional cost to the Government. Final tests shall assure that this requirement is met.

B. Resistance of the grounding electrode system shall be measured using a four-terminal fall-of-potential method as defined in IEEE 81. Ground resistance measurements shall be made before the electrical distribution system is energized and shall be made in normally dry conditions not less than 48 hours after the last rainfall. Resistance measurements of

separate grounding electrode systems shall be made before the systems are bonded together below grade. The combined resistance of separate systems may be used to meet the required resistance, but the specified number of electrodes must still be provided.

C. Services at power company interface points shall comply with the power company ground resistance requirements.

D. Below-grade connections shall be visually inspected by the Resident Engineer prior to backfilling. The Contractor shall notify the Resident Engineer 24 hours before the connections are ready for inspection.

3.11 GROUND ROD INSTALLATION

A. Drive each rod vertically in the earth, not less than 3000 mm (10 feet) in depth.

B. Where permanently concealed ground connections are required, make the connections by the exothermic process to form solid metal joints. Make accessible ground connections with mechanical pressure type ground connectors.

C. Where rock prevents the driving of vertical ground rods, install angled ground rods or grounding electrodes in horizontal trenches to achieve the specified resistance.

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SECTION 26 05 33
RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies the furnishing, installation, and connection of conduit, fittings, and boxes to form complete, coordinated, grounded raceway systems. Raceways are required for all wiring unless shown or specified otherwise.

B. Definitions: The term conduit, as used in this specification, shall mean any or all of the raceway types specified.

1.2 RELATED WORK

A. Bedding of conduits: Section 00405, TRENCH EXCAVATION, BEDDING, AND BACKFILL.

B. Mounting board for telephone closets: Section 06 10 00, ROUGH CARPENTRY.

C. Sealing around penetrations to maintain the integrity of fire rated construction: Section 07 84 00, FIRESTOPPING.

D. Fabrications for the deflection of water away from the building envelope at penetrations: Section 07 60 00, FLASHING AND SHEET METAL.

E. Sealing around conduit penetrations through the building envelope to prevent moisture migration into the building: Section 07 92 00, JOINT SEALANTS.

F. Identification and painting of conduit and other devices: Section 09 91 00, PAINTING.

G. General electrical requirements and items that is common to more than one section of Division 26: Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

H. Requirements for personnel safety and to provide a low impedance path for possible ground fault currents: Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS.

1.3 SUBMITTALS

In accordance with Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES, furnish the following:

A. Shop Drawings:

1. Size and location of main feeders;
2. Size and location of panels and pull boxes
3. Layout of required conduit penetrations through structural elements.
4. The specific item proposed and its area of application shall be identified on the catalog cuts.

B. Certification: Prior to final inspection, deliver to the Resident Engineer four copies of the certification that the material is in accordance with the drawings and specifications and has been properly installed.

1.4 APPLICABLE PUBLICATIONS

Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

A. National Fire Protection Association (NFPA):

70-05.....National Electrical Code (NEC)

B. Underwriters Laboratories, Inc. (UL):

1-03.....Flexible Metal Conduit
5-01.....Surface Metal Raceway and Fittings
6-03.....Rigid Metal Conduit
50-03.....Enclosures for Electrical Equipment
360-03.....Liquid-Tight Flexible Steel Conduit
467-01.....Grounding and Bonding Equipment
514A-01.....Metallic Outlet Boxes
514B-02.....Fittings for Cable and Conduit
514C-05.....Nonmetallic Outlet Boxes, Flush-Device Boxes and Covers
651-02.....Schedule 40 and 80 Rigid PVC Conduit
651A-03.....Type EB and A Rigid PVC Conduit and HDPE Conduit
797-03.....Electrical Metallic Tubing
1242-00.....Intermediate Metal Conduit

C. National Electrical Manufacturers Association (NEMA):

TC-3-04.....PVC Fittings for Use with Rigid PVC Conduit and Tubing
FB1-03.....Fittings, Cast Metal Boxes and Conduit Bodies for Conduit, Electrical Metallic Tubing and Cable

PART 2 - PRODUCTS

2.1 MATERIAL

A. Conduit Size: In accordance with the NEC, but not less than 13 mm (1/2 inch) unless otherwise shown. Where permitted by the NEC, 13 mm (1/2 inch) flexible conduit may be used for tap connections to recessed lighting fixtures.

B. Conduit:

1. Rigid galvanized steel: Shall Conform to UL 6, ANSI C80.1.
2. Rigid aluminum: Shall Conform to UL 6A, ANSI C80.5.

3. Rigid intermediate steel conduit (IMC): Shall Conform to UL 1242, ANSI C80.6.
4. Electrical metallic tubing (EMT): Shall Conform to UL 797, ANSI C80.3. Maximum size not to exceed 105 mm (4 inch) and shall be permitted only with cable rated 600 volts or less.
5. Flexible galvanized steel conduit: Shall Conform to UL 1.
6. Liquid-tight flexible metal conduit: Shall Conform to UL 360.
7. Direct burial plastic conduit: Shall conform to UL 651 and UL 651A, heavy wall PVC or high density polyethylene (PE).
8. Surface metal raceway: Shall Conform to UL 5.

C. Conduit Fittings:
1. Rigid steel and IMC conduit fittings:
   a. Fittings shall meet the requirements of UL 514B and ANSI/NEMA FB1.
   b. Standard threaded couplings, locknuts, bushings, and elbows: Only steel or malleable iron materials are acceptable. Integral retractable type IMC couplings are also acceptable.
   c. Locknuts: Bonding type with sharp edges for digging into the metal wall of an enclosure.
   d. Bushings: Metallic insulating type, consisting of an insulating insert molded or locked into the metallic body of the fitting. Bushings made entirely of metal or nonmetallic material are not permitted.
   e. Erickson (union-type) and set screw type couplings: Approved for use in concrete are permitted for use to complete a conduit run where conduit is installed in concrete. Use set screws of case hardened steel with hex head and cup point to firmly seat in conduit wall for positive ground. Tightening of set screws with pliers is prohibited.
   f. Sealing fittings: Threaded cast iron type. Use continuous drain type sealing fittings to prevent passage of water vapor. In concealed work, install fittings in flush steel boxes with blank cover plates having the same finishes as that of other electrical plates in the room.
2. Rigid aluminum conduit fittings:
   a. Standard threaded couplings, locknuts, bushings, and elbows: Malleable iron, steel or aluminum alloy materials; Zinc or cadmium plate iron or steel fittings. Aluminum fittings containing more than 0.4 percent copper are prohibited.
   b. Locknuts and bushings: As specified for rigid steel and IMC conduit.
   c. Set screw fittings: Not permitted for use with aluminum conduit.

3. Electrical metallic tubing fittings:
   a. Fittings shall meet the requirements of UL 514B and ANSI/NEMA FB1.
   b. Only steel or malleable iron materials are acceptable.
   c. Couplings and connectors: Concrete tight and rain tight, with connectors having insulated throats. Use gland and ring compression type couplings and connectors for conduit sizes 50 mm (2 inches) and smaller. Use set screw type couplings with four set screws each for conduit sizes over 50 mm (2 inches). Use set screws of case-hardened steel with hex head and cup point to firmly seat in wall of conduit for positive grounding.
   d. Indent type connectors or couplings are prohibited.
   e. Die-cast or pressure-cast zinc-alloy fittings or fittings made of "pot metal" are prohibited.
4. Flexible steel conduit fittings:
   a. Conform to UL 514B. Only steel or malleable iron materials are acceptable.
   b. Clamp type, with insulated throat.
5. Liquid-tight flexible metal conduit fittings:
   a. Fittings shall meet the requirements of UL 514B and ANSI/NEMA FB1.
   b. Only steel or malleable iron materials are acceptable.
   c. Fittings must incorporate a threaded grounding cone, a steel or plastic compression ring, and a gland for tightening. Connectors shall have insulated throats.
6. Direct burial plastic conduit fittings:
   a. Fittings shall meet the requirements of UL 514C and NEMA TC3.
   b. As recommended by the conduit manufacturer.
7. Surface metal raceway fittings: As recommended by the raceway manufacturer.
8. Expansion and deflection couplings:
   a. Conform to UL 467 and UL 514B.
   b. Accommodate, 19 mm (0.75 inch) deflection, expansion, or contraction in any direction, and allow 30 degree angular deflections.
   c. Include internal flexible metal braid sized to guarantee conduit ground continuity and fault currents in accordance with UL 467, and the NEC code tables for ground conductors.
   d. Jacket: Flexible, corrosion-resistant, watertight, moisture and heat resistant molded rubber material with stainless steel jacket clamps.

D. Conduit Supports:
   1. Parts and hardware: Zinc-coat or provide equivalent corrosion protection.
   2. Individual Conduit Hangers: Designed for the purpose, having a pre-assembled closure bolt and nut, and provisions for receiving a hanger rod.
   3. Multiple conduit (trapeze) hangers: Not less than 38 mm by 38 mm (1-1/2 by 1-1/2 inch), 12 gage steel, cold formed, lipped channels; with not less than 9 mm (3/8 inch) diameter steel hanger rods.
   4. Solid Masonry and Concrete Anchors: Self-drilling expansion shields, or machine bolt expansion.

E. Outlet, Junction, and Pull Boxes:
   1. UL-50 and UL-514A.
   2. Cast metal where required by the NEC or shown, and equipped with rustproof boxes.
   3. Sheet metal boxes: Galvanized steel, except where otherwise shown.
   4. Flush mounted wall or ceiling boxes shall be installed with raised covers so that front face of raised cover is flush with the wall. Surface mounted wall or ceiling boxes shall be installed with surface style flat or raised covers.

F. Wireways: Equip with hinged covers, except where removable covers are shown.

G. Warning Tape: Standard, 4-Mil polyethylene 76 mm (3 inch) wide tape detectable type, red with black letters, and imprinted with “CAUTION BURIED ELECTRIC LINE BELOW”.

PART 3 - EXECUTION

3.1 PENETRATIONS

A. Cutting or Holes:
   1. Locate holes in advance where they are proposed in the structural sections such as ribs or beams. Obtain the approval of the // Resident Engineer // COTR // prior to drilling through structural sections.
   2. Cut holes through concrete and masonry in new and existing structures with a diamond core drill or concrete saw. Pneumatic hammer, impact electric, hand or manual hammer type drills are not allowed, except where permitted by the // Resident Engineer // COTR // as required by limited working space.

B. Fire Stop: Where conduits, wireways, and other electrical raceways pass through fire partitions, fire walls, smoke partitions, or floors, install a fire stop that provides an effective barrier against the spread of fire, smoke and gases as specified in Section 07 84 00,

FIRESTOPPING, with rock wool fiber or silicone foam sealant only. Completely fill and seal clearances between raceways and openings with the fire stop material.

C. Waterproofing: At floor, exterior wall, and roof conduit penetrations, completely seal clearances around the conduit and make watertight as specified in Section 07 92 00, JOINT SEALANTS.

3.2 INSTALLATION, GENERAL

A. In accordance with UL, NEC, as shown, and as hereinafter specified.

B. Essential (Emergency) raceway systems shall be entirely independent of other raceway systems, except where specifically "accepted" by NEC Article 517.

C. Install conduit as follows:

1. In complete runs before pulling in cables or wires.
2. Flattened, dented, or deformed conduit is not permitted. Remove and replace the damaged conduits with new undamaged material.
3. Assure conduit installation does not encroach into the ceiling height head room, walkways, or doorways.
4. Cut square with a hacksaw, ream, remove burrs, and draw up tight.
5. Mechanically and electrically continuous.
6. Independently support conduit at 8’0” on center. Do not use other supports i.e., (suspended ceilings, suspended ceiling supporting members, lighting fixtures, conduits, mechanical piping, or mechanical ducts).
7. Support within 300 mm (1 foot) of changes of direction, and within 300 mm (1 foot) of each enclosure to which connected.
8. Close ends of empty conduit with plugs or caps at the rough-in stage to prevent entry of debris, until wires are pulled in.
9. Conduit installations under fume and vent hoods are prohibited.
10. Secure conduits to cabinets, junction boxes, pull boxes and outlet boxes with bonding type locknuts. For rigid and IMC conduit installations, provide a locknut on the inside of the enclosure, made up wrench tight. Do not make conduit connections to junction box covers.
11. Flashing of penetrations of the roof membrane is specified in Section 07 60 00, FLASHING AND SHEET METAL.
12. Do not use aluminum conduits in wet locations.
13. Unless otherwise indicated on the drawings or specified herein, all conduits shall be installed concealed within finished walls, floors and ceilings.

D. Conduit Bends:
   1. Make bends with standard conduit bending machines.
   2. Conduit hickey may be used for slight offsets, and for straightening stubbed out conduits.
   3. Bending of conduits with a pipe tee or vise is prohibited.

E. Layout and Homeruns:
   1. Install conduit with wiring, including homeruns, as shown.
   2. Deviations: Make only where necessary to avoid interferences and only after drawings showing the proposed deviations have been submitted approved by the // Resident Engineer // COTR //.

3.3 CONCEALED WORK INSTALLATION

A. In Concrete:
   1. Conduit: Rigid steel, IMC or EMT. Do not install EMT in concrete slabs that are in contact with soil, gravel or vapor barriers.
   2. Align and run conduit in direct lines.
   3. Install conduit through concrete beams only when the following occurs:
      a. Where shown on the structural drawings.
      b. As approved by the // Resident Engineer // COTR // prior to construction, and after submittal of drawing showing location, size, and position of each penetration.
   4. Installation of conduit in concrete that is less than 75 mm (3 inches) thick is prohibited.
      a. Conduit outside diameter larger than 1/3 of the slab thickness is prohibited.
      b. Space between conduits in slabs: Approximately six conduit diameters apart, except one conduit diameter at conduit crossings.
      c. Install conduits approximately in the center of the slab so that there will be a minimum of 19 mm (3/4 inch) of concrete around the conduits.
   5. Make couplings and connections watertight. Use thread compounds that are UL approved conductive type to insure low resistance ground continuity through the conduits. Tightening set screws with pliers is prohibited.

B. Furred or Suspended Ceilings and in Walls:
   1. Conduit for conductors above 600 volts:
      a. Rigid steel or rigid aluminum.
      b. Aluminum conduit mixed indiscriminately with other types in the same system is prohibited.
   2. Conduit for conductors 600 volts and below:
      a. Rigid steel, IMC, rigid aluminum, or EMT. Different type conduits mixed indiscriminately in the same system is prohibited.

3. Align and run conduit parallel or perpendicular to the building lines.
4. Connect recessed lighting fixtures to conduit runs with maximum 1800 mm (six feet) of flexible metal conduit extending from a junction box to the fixture.
5. Tightening set screws with pliers is prohibited.

3.4 EXPOSED WORK INSTALLATION

A. Unless otherwise indicated on the drawings, exposed conduit is only permitted in mechanical and electrical rooms.
B. Conduit for conductors above 600 volts:
   1. Rigid steel or rigid aluminum.
   2. Aluminum conduit mixed indiscriminately with other types in the same system is prohibited.
C. Conduit for Conductors 600 volts and below:
   1. Rigid steel, IMC, rigid aluminum, or EMT. Different type of conduits mixed indiscriminately in the system is prohibited.
D. Align and run conduit parallel or perpendicular to the building lines.
E. Install horizontal runs close to the ceiling or beams and secure with conduit straps.
F. Support horizontal or vertical runs at not over 2400 mm (eight foot) intervals.
G. Surface metal raceways: Use only where shown.
H. Painting:
   1. Paint exposed conduit as specified in Section 09 91 00, PAINTING.
   2. Paint all conduits containing cables rated over 600 volts safety orange. Refer to Section 09 91 00, PAINTING for preparation, paint type, and exact color. In addition, paint legends, using 50 mm (two inch) high black numerals and letters, showing the cable voltage rating. Provide legends where conduits pass through walls and floors and at maximum 6000 mm (20 foot) intervals in between.

3.5 DIRECT BURIAL INSTALLATION

A. Exterior routing of Lighting Systems and Other Branch circuits (600 Volt and Less, and 1500 mm (5 feet) from the buildings):
   1. Conduit: Thick wall PVC or high density PE, unless otherwise shown.
   2. Mark conduit at uniform intervals to show the kind of material, direct burial type, and the UL approval label.
   3. Install conduit fittings and terminations as recommended by the conduit manufacturer.
   4. Tops of conduits shall be as follows unless otherwise shown:
      a. Not less than 600 mm (24 inches) below finished grade.
      b. Not less than 750 mm (30 inches) below road and other paved surfaces.

5. Work with extreme care near existing ducts, conduits, cables, and other utilities to avoid damaging them.
6. Excavation for conduit bedding and back-filling of trenches is specified in Section 00405 TRENCH EXCAVATION, BEDDING AND BACKFILL.
   a. Cut the trenches neatly and uniformly.
   b. Do not kink the conduits.
7. Seal conduits, including spare conduits, at building entrances and at outdoor terminations for equipment with a suitable compound that prevents the entrance of moisture and gases.
8. Where metal conduit is shown, install threaded heavy wall rigid steel galvanized conduit or type A20 rigid steel galvanized conduit coated with .5 mm (20 mil) bonded PVC, or rigid steel or IMC, PVC coated or standard coated with bituminous asphaltic compound.
9. Warning tape shall be continuously placed 300 mm (12 inches) above conduits or electric lines.

B. Exterior routing of lighting systems and other branch circuits (600 volts and less-under buildings slab on grade to 1500 mm (5 feet) from the building):
   1. Pre-coated rigid galvanized steel conduit in accordance with the requirements of Section 26 05 41, UNDERGROUND ELECTRICAL CONSTRUCTION.

3.6 HAZARDOUS LOCATIONS

A. Use rigid steel conduit only, notwithstanding requirements otherwise specified in this or other sections of these specifications.
B. Install UL approved sealing fittings, that prevent passage of explosive vapors, in hazardous areas equipped with explosive proof lighting fixtures, switches, and receptacles, as required by the NEC.

3.7 WET OR DAMP LOCATIONS

A. Unless otherwise shown, use conduits of rigid steel or IMC.
B. Provide sealing fittings, to prevent passage of water vapor, where conduits pass from warm to cold locations, i.e., (refrigerated spaces, constant temperature rooms, air conditioned spaces building exterior walls, roofs) or similar spaces.
C. Unless otherwise shown, use rigid steel or IMC conduit within 1500 mm (5 feet) of the exterior and below concrete building slabs in contact with soil, gravel, or vapor barriers. Conduit shall include an outer factory coating of .5 mm (20 mil) bonded PVC or field coat with asphaltum before installation. After installation, completely coat damaged areas of coating.

3.8 MOTORS AND VIBRATING EQUIPMENT

A. Use flexible metal conduit for connections to motors and other electrical equipment subject to movement, vibration, misalignment, cramped quarters, or noise transmission.

B. Provide liquid-tight flexible metal conduit for installation in exterior locations, moisture or humidity laden atmosphere, corrosive atmosphere, water or spray wash-down operations, inside (air stream) of HVAC units, and locations subject to seepage or dripping of oil, grease or water. Provide a green ground wire with flexible metal conduit.

3.9 EXPANSION JOINTS

A. Conduits 75 mm (3 inches) and larger, that are secured to the building structure on opposite sides of a building expansion joint, require expansion and deflection couplings. Install the couplings in accordance with the manufacturer's recommendations.

B. Provide conduits smaller than 75 mm (3 inches) with junction boxes on both sides of the expansion joint. Connect conduits to junction boxes with sufficient slack of flexible conduit to produce 125 mm (5 inch) vertical drop midway between the ends. Flexible conduit shall have a copper green ground bonding jumper installed. In lieu of this flexible conduit, expansion and deflection couplings as specified above for 375 mm (15 inches) and larger conduits are acceptable.

C. Install expansion and deflection couplings where shown.

3.10 CONDUIT SUPPORTS, INSTALLATION

A. Safe working load shall not exceed 1/4 of proof test load of fastening devices.

B. Use pipe straps or individual conduit hangers for supporting individual conduits. Maximum distance between supports is 2.5 m (8 foot) on center.

C. Support multiple conduit runs with trapeze hangers. Use trapeze hangers that are designed to support a load equal to or greater than the sum of the weights of the conduits, wires, hanger itself, and 90 kg (200 pounds). Attach each conduit with U-bolts or other approved fasteners.

D. Support conduit independently of junction boxes, pull boxes, fixtures, suspended ceiling T-bars, angle supports, and similar items.

E. Fasteners and Supports in Solid Masonry and Concrete:

1. New Construction: Use steel or malleable iron concrete inserts set in place prior to placing the concrete.
2. Existing Construction:
   a. Steel expansion anchors not less than 6 mm (1/4 inch) bolt size and not less than 28 mm (1-1/8 inch) embedment.

b. Power set fasteners not less than 6 mm (1/4 inch) diameter with depth of penetration not less than 75 mm (3 inches).
c. Use vibration and shock resistant anchors and fasteners for attaching to concrete ceilings.

F. Hollow Masonry: Toggle bolts are permitted.
G. Bolts supported only by plaster or gypsum wallboard are not acceptable.
H. Metal Structures: Use machine screw fasteners or other devices specifically designed and approved for the application.
I. Attachment by wood plugs, rawl plug, plastic, lead or soft metal anchors, or wood blocking and bolts supported only by plaster is prohibited.
J. Chain, wire, or perforated strap shall not be used to support or fasten conduit.
K. Spring steel type supports or fasteners are prohibited for all uses except: Horizontal and vertical supports/fasteners within walls.
L. Vertical Supports: Vertical conduit runs shall have riser clamps and supports in accordance with the NEC and as shown. Provide supports for cable and wire with fittings that include internal wedges and retaining collars.

3.11 BOX INSTALLATION

A. Boxes for Concealed Conduits:
1. Flush mounted.
2. Provide raised covers for boxes to suit the wall or ceiling, construction and finish.

B. In addition to boxes shown, install additional boxes where needed to prevent damage to cables and wires during pulling in operations.
C. Remove only knockouts as required and plug unused openings. Use threaded plugs for cast metal boxes and snap-in metal covers for sheet metal boxes.
D. Outlet boxes in the same wall mounted back-to-back are prohibited. A minimum 600 mm (24 inch), center-to-center lateral spacing shall be maintained between boxes.)
E. Minimum size of outlet boxes for ground fault interrupter (GFI) receptacles is 100 mm (4 inches) square by 55 mm (2-1/8 inches) deep, with device covers for the wall material and thickness involved.
F. Stencil or install phenolic nameplates on covers of the boxes identified on riser diagrams; for example "SIG-FA JB No. 1".
G. On all Branch Circuit junction box covers, identify the circuits with black marker.

- - - E N D - - -

SECTION 26 05 41
UNDERGROUND ELECTRICAL CONSTRUCTION

PART 1 - GENERAL

1.1 DESCRIPTION

A. This section specifies the furnishing, installation and connection of manholes, handholes and ducts to form a complete underground raceway system.

B. "Duct" and "conduit", and "rigid metal conduit" and "rigid steel conduit" are used interchangeably in this specification and have the same meaning.

1.2 RELATED WORK

A. Manholes: Section 00405, TRENCH EXCAVATION, BEDDING, AND BACKFILL.

B. Section 05 50 00, METAL FABRICATIONS: Ladders.

C. Section 07 92 00, JOINT SEALANTS: Sealing of conduit penetrations.

D. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements and items that are common to more than one section of Division 26.

E. Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits, fittings and boxes for raceway systems.

F. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.

1.3 SUBMITTALS

A. Submit in accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

B. Shop Drawings:

1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
2. Include manholes, handholes, duct materials, and hardware. Proposed deviations from details on the drawings shall be clearly marked on the submittals.
    1) If necessary to locate manholes or handholes at locations other than shown on the drawings, show the proposed locations accurately on scaled site drawings, and submit four copies to the Resident Engineer for approval prior to construction.
3. Reinforcement shop drawings for precast manholes prepared in accordance with ACI-SP-66.
4. Precast manholes and handholes: Submit plans on elevation showing openings, pulling irons cable supports, sump and other details. Also, submit detail drawings and design calculations for approval

prior to installation. Submittal shall bear the seal of a registered structural engineer.

C. Certifications: Two weeks prior to final inspection, submit four copies of the following to the Resident Engineer:
   1. Certification that the materials are in accordance with the drawings and specifications.
   2. Certification, by the Contractor, that the complete installation has been properly installed and tested.

1.4 APPLICABLE PUBLICATIONS

Publications listed below (including amendments, addenda, revisions, supplements, and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

A. American Concrete Institute (ACI):
   Building Code Requirements for Structural Concrete
   318/318M-2005.....Building Code Requirements for Structural Concrete & Commentary
   SP-66-04.....ACI Detailing Manual

B. American Society for Testing and Materials (ASTM):
   C478/C478M 2006(b).....Standard Specification for Precast Reinforced Concrete Manhole Sections
   C990 REV A 2003 .....Standard Specification for joints concrete pipe, Manholes and Precast Box using performed flexible Joint sealants.

C. Institute of Electrical and Electronic Engineers (IEEE):
   C2-2002 .....National Electrical Safety Code

D. National Electrical Manufacturers Association (NEMA):
   RNI 2005.....Polyvinyl Chloride (PVC) Externally Coated Galvanized Rigid Steel Conduit and Intermediate Metal Conduit
   TC 2 2003.....Electrical Polyvinyl Chloride (PVC) Tubing And Conduit
   TC 3-2004.....PVC Fittings for Use With Rigid PVC Conduit And Tubing
   TC 6 & 8 2003.....PVC Plastic Utilities Duct For Underground Installations
   TC 9-2004.....Fittings For PVC Plastic Utilities Duct For Underground Installation

E. National Fire Protection Association (NFPA):
   70 2005.....National Electrical Code (NEC)

F. Underwriters Laboratories, Inc. (UL):

6-2004.....Electrical Rigid Metal Conduit-Steel

467-2004.....Standard for Grounding and Bonding Equipment

651-2005.....Standard for Schedule 40 and 80 Rigid PVC Conduit and Fittings

651A-2003.....Type EB and A Rigid PVC Conduit and HDPE Conduit, (RTRC)

651B-2002.....Continuous Length HDPE Conduit

G. U.S. General Services Administration (GSA):

A-A-60005-1998.....Frames, Covers, Gratings, Steps, Sump and Catch Basin, Manhole

SS-S-210A-1981.....Sealing Compound, Preformed Plastic for Expansion joints And Pipe Joints

PART 2 - PRODUCTS

2.1 CONCRETE MANHOLES AND HARDWARE

A. Reinforced Concrete: ACI 318, 20MPA (3000 psi) minimum 28-day compressive strength.

B. Reinforcing Steel: Number 4 minimum.

C. Manhole Hardware:

1. Frames and covers (traffic type):
   a. GSA A-A-60005 Type III.
   b. Frames: Style A, size 30A.
   c. Covers, Type D, size 30A, marked "POWER" or "SIGNAL" as applicable.
2. Sump frames and gratings:
   a. GSA A-A-60005.
   b. Frames, Type VII.
   c. Gratings, Type I.
3. Pulling Irons: 22 mm (7/8-inch) diameter hot-dipped galvanized steel bar with exposed triangular shaped opening.
4. Cable supports:
   a. Cable stanchions, hot rolled, heavy duty, hot-dipped galvanized "T" section steel 56 mm (2-1/4 inches) by 6 mm (1/4-inch) in size and punched with 14 holes on 38 mm (1-1/2 inch) centers for attaching cable arms.
   b. Cable arms, 5 mm (3/16-inch) gage, hot rolled, hot-dipped galvanized sheet steel pressed to channel shape. Arms shall be approximately 63 mm (2-1/2 inches) wide and 350 mm (14 inches) long.
   c. Insulators for cable supports, high glazed, wet process porcelain.
   d. Spares: Equip each cable stanchion with two spare cable arms and six spare insulators for future use.
   e. Miscellaneous hardware, hot-dipped galvanized steel.

5. Manhole Ladders:
   a. Manhole Ladders: Aluminum with 400 mm (16 inch) rung spacing, and per the requirements of Section 05 50 00, METAL FABRICATIONS.
6. //Manhole Lighting:
   a. Weatherproof NEMA 3 Lighting switch mounted no more than 2 feet from top of ladder and 100 W incandescent light fixtures shall be provided in manhole. Provide dedicated 20mm (3/4 inches) direct buried conduit to nearest electrical panelboard for circuit conductors.//
7. //Sump Pump: Provide sump pump complete with float switch, weatherproof receptacle and T-rated switch in manhole. Provide dedicated 20mm (3/4 inches) direct buried conduit to nearest electrical panelboard for circuit conductors.//

D. Handhole Hardware:
   1. Frames and covers configuration as shown on the drawings. Cast the words “Electric” and “Telephone” in the top face of the power and telephone manhole covers respectively.
   2. Pulling irons, 22 mm (7/8-inch) diameter galvanized steel bar with exposed triangular shaped opening.
   3. Cable supports are not required.

E. Ground Rod Sleeve: Provide a 75 mm (3 inches) PVC sleeve in manhole floors so that a driven ground rod may be installed.

F. In lieu of poured-in-place manholes and handholes, the Contractor may provide precast units. Units shall comply with ASTM C478, C478M.
   1. Size: Plan area and clear height shall be not less than that shown on the drawings for poured-in-place type.
   2. Accessories, hardware, and facilities shall be the same as required for poured-in-place type.
   3. Assume ground water level 900 mm (3 feet) below ground surface unless a higher water table is shown in the boring logs and adjust design accordingly.
   4. Construction:
      a. Units, precast monolithically or of assembled sections. Base and first riser shall be monolithic.
      b. Provide tongue-and-groove joints to firmly interlock adjoining components. Seal joints watertight using preformed plastic or rubber materials conforming to ASTM C990 or GSA SS-S-210A. Install sealing material in strict accordance with the sealant manufacturers' printed instructions.
      c. Provide lifting devices cast into units.

d. Identify all structures with manufacturer's name embedded in, or otherwise permanently attached to an interior wall face.
e. Provide a sleeve in manhole floors so that a driven ground rod may be installed.

2.2 FIBERGLASS HANDHOLES

Shall be matched die molded of dark green fiberglass with approximate dimensions of 810 mm (32 inches) high, top surface of 1090 by 950 mm (43 by 37½ inches), and top opening of 810 by 660 mm (32 by 26 inches). When buried, the unit shall be capable of supporting an ultimate downward load of 2955 kg (6500 pounds) distributed over a 150 by 150 mm (6 by 6 inch) area imposed anywhere on the cover surface. Unit shall have precut 150 by 150 mm (6 by 6 inches) cable entrance at the center bottom of each side. A fiberglass weatherproof cover with nonskid surface shall be provided for each handhole. Covers shall be capable of being locked into position.

2.3 DUCTS

A. Number and sizes shall be as shown on drawings.
B. Ducts (concrete encased):
   1. Plastic Duct:
      a. // NEMA TC6 & 8 and TC9 plastic utilities duct // // UL 651 and 651A Schedule 40 PVC //.
      b. Duct shall be suitable for use with 90 degree C rated conductors.
   2. Conduit Spacers: Prefabricated plastic.
C. Ducts (direct burial):
   1. Plastic duct:
      a. NEMA TC2 and TC3
      b. UL 651, 651A and 651B, //Schedule 40// //Schedule 80// PVC or HDPE.
      c. Duct shall be suitable for use with 75 degree C rated conductors.
   2. Rigid metal conduit, PVC-coated: UL6 and NEMA RN1 galvanized rigid steel, threaded type, coated with PVC sheath bonded to the galvanized exterior surface, nominal 1 mm (0.040 inch) thick.

2.4 GROUNDING

A. Rods: Per Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS and UL 467
B. Ground Wire: Stranded bare copper 16 mm² (6 AWG) minimum.

2.5 WARNING TAPE

Standard 4-mil polyethylene 76 mm (3 inch) wide tape, detectable type, red with black letters, imprinted with “CAUTION BURIED ELECTRIC CABLE BELOW”.

2.6 PULL ROPE

Plastic with 890N (200 pound) minimum tensile strength.

PART 3 - EXECUTION

3.1 MANHOLE AND HANDHOLE CONSTRUCTION AND INSTALLATION

A. General Requirements:

1. Construct manholes of reinforced concrete.
2. Locate manholes and handholes at the approximate locations shown on the drawings with due consideration given to the location of other utilities, grades, and paving.
3. Steel reinforcing concrete cover, not less than 50 mm (2 inches) thick for exterior surfaces, 38 mm (1 1/2 inches) thick for interior surfaces, and 25 mm (1 inch) thick for the bottom surfaces of the top slabs.
4. Walls, floors, and top:
   a. Construct monolithic walls and floors with window openings in walls for ducts.
   b. Provide sump pits in the floor of manholes for drainage.
   c. Provide manhole with a circular opening suitable for the installation of the frame and cover. Provide water stops at framed cold joints.
5. Duct terminations: Provide windows at duct bank terminations and fill with concrete after duct placement. Terminations shall be sealed watertight.
6. Pulling irons:
   a. Provide pulling irons opposite each duct entrance.
   b. Cast pulling irons in the walls opposite duct windows approximately 152mm (6 inches) above the top of the window.

B. Manhole Access:

1. Manhole chimney shall consist of a sufficient number of brick and mortar courses between top of manhole and manhole frame to reach the required level. Grout the manhole frame to the chimney.
2. The top of frames and covers shall be flush type, with the finish flush with finished grade in paved and unpaved areas.
3. Frames and covers in roadways and paved areas shall be traffic type. In unpaved areas frames and covers may be non-traffic type.

C. Access for Handholes: Make the top of frames and covers flush with finished grade.

D. Manhole Cable Racks:

1. Provide cable racks with porcelain insulator supports in each manhole.
2. Cable support intervals shall not exceed 900mm (36 inches).

3. Install racks at the above spacing on all walls for not less than one cable, whether or not the racks will be used for cables. Install additional racks as required for the cables.
4. Each rack shall include cable support insulators.

E. Ground Rods and Grounding in Manholes:
1. Ground rods:
a. Rods shall protrude approximately 100 mm (4 inches) above the manhole floor.
b. Poured-in-place manholes: Drive a ground rod into the earth, before the floor is placed, at a convenient point close to the manhole wall.
c. Precast manholes: Drive a ground rod into the earth, through the floor sleeve, after the manhole is set in place. Fill the sleeve with a sealant to make a watertight seal.
2. Grounding Conductors:
a. Install a 95 mm² (3/0 AWG) bare copper ring grounding conductor around the inside perimeter of the manhole and anchor to the walls with metallic cable clips.
b. Connect the ring grounding conductor to the ground rod by an exothermic welding process.
c. Bond the ring grounding conductor to the duct bank equipment grounding conductors, the exposed non-current carrying metal parts of racks, sump covers, and like items in the manholes with a minimum 16 mm² (6 AWG) bare copper jumper.

F. Precast Units:
1. Precast units shall have the same accessories and facilities as specified above.
2. Assembly and installation of precast components shall follow the printed instructions and recommendations of the manufacturer of the units.
3. Units shall be installed on a 300 mm (12 inch) level bed of 90% compacted granular fill, well-graded from the 25 mm (1 inch) sieve to the No. 4 sieve. Granular fill shall be compacted with a minimum of four passes with a plate compactor.
4. Seal duct terminations watertight.

G. Ladders: Provide securely mounted ladder for every manhole over 1200 mm (4 feet) deep.

3.2 TRENCHING

A. Refer to Section 00405 TRENCH EXCAVATION, BEDDING AND BACKFILL for trenching back-filling, and compaction.

B. Work with extreme care near existing ducts, conduits, cables, and other utilities to avoid damaging them.
C. Cut the trenches neatly and uniformly.
D. For Concrete Encased Ducts:
   1. After excavation of the trench, stakes shall be driven in the bottom of the trench at 1200 mm (4 foot) intervals to establish the grade and route of the duct bank.
   2. Pitch the trenches uniformly towards manholes or both ways from high points between manholes for the required duct line drainage. Avoid pitching the ducts towards buildings wherever possible.
   3. The walls of the trench may be used to form the side walls of the duct bank provided that the soil is self-supporting and that concrete envelope can be poured without soil inclusions. Forms are required where the soil is not self-supporting.
   4. After the concrete encased duct has sufficiently cured, the trench shall be backfilled to grade with earth, with appropriate warning tape attached.
E. Conduits to be installed under existing paved areas, roads, and railroad tracks that are not to be disturbed shall be jacked into place. Conduits shall be PVC-coated rigid metal.

3.3 DUCT INSTALLATION

A. General Requirements:
   1. Ducts shall be in accordance with the NEC and IEEE C2, as shown on the drawings, and as specified.
   2. Slope ducts to drain towards manholes and handholes, and away from building and equipment entrances. Pitch not less than 100 mm (4 inches) in 30 M (100 feet).
   3. Underground conduit stub-ups and sweeps to equipment inside of buildings shall be PVC-coated galvanized rigid steel, and shall extend a minimum of 1500 mm (5 feet) outside of building foundation.
   4. Stub-ups, sweeps, and risers to equipment mounted on outdoor concrete slabs shall be PVC-coated galvanized rigid steel, and shall extend a minimum of 1500 mm (5 feet) away from edge of slab.
   5. Install insulated grounding bushings on the terminations.
   6. PVC-coated rigid steel conduits shall be coupled to the ducts with suitable adapters, and the whole encased with 75 mm (3 inches) of concrete.
   7. PVC coated rigid steel conduit turns of direction for all duct lines shall have minimum 1200 mm (4 feet) radius in the horizontal and vertical directions. PVC conduit sweeps for all duct lines shall have a minimum 12000 mm (40 feet) radius in the horizontal and 1200

mm (4 feet) in the vertical directions. Where a 12000 mm (40 feet) radius is not possible, horizontal turns of direction shall be rigid steel.

8. All multiple conduit runs shall have conduit spacers. Spacers shall securely support and maintain uniform spacing of the duct assembly a minimum of 75 mm (3 inches) above bottom of trench during the concrete pour. Spacer spacing shall not exceed 1500 mm (5 feet).
9. Duct lines shall be installed no less than 300 mm (12 inches) from other utility systems, such as water, sewer, and chilled water.
10. Clearances between individual ducts:
    a. For like services, not less than 75 mm (3 inches).
    b. For power and signal services, not less than 150 mm (6 inches).
    c. Provide plastic spacers to maintain clearances.
    d. Provide nonferrous tie wires to prevent displacement of the ducts during pouring of concrete. Tie wires shall not act as substitute for spacers.
11. Duct lines shall terminate at window openings in manhole walls as shown on the drawings. All ducts shall be fitted with end bells.
12. Couple the ducts with proper couplings. Stagger couplings in rows and layers to insure maximum strength and rigidity of the duct bank.
13. Keep ducts clean of earth, sand, or gravel during construction, and seal with tapered plugs upon completion of each portion of the work.

B. Concrete Encased Ducts and Conduits:

1. Install concrete encased ducts for medium and high voltage systems, low voltage systems, and signal systems unless otherwise shown on the drawings.
2. Duct lines shall consist of single or multiple duct assemblies encased in concrete. Ducts shall be uniform in size and material throughout the installation.
3. Tops of concrete-encased ducts shall be:
    a. Not less than 600 mm (24 inches) and not less than shown on the drawings, below finished grade.
    b. Not less than 750 mm (30 inches) and not less than shown on the drawings, below roads and other paved surfaces.
    c. Conduits crossing under grade slab construction joints shall be installed a minimum of 1200 mm (4 feet) below slab.
4. Extend the concrete envelope encasing the ducts not less than 75 mm (3 inches) beyond the outside walls of the outer ducts and conduits.

5. Within 3000 mm (10 feet) of building, manhole and handhole wall penetrations, install reinforcing steel bars at the top and bottom of each concrete envelope to provide protection against vertical shearing.
6. Install reinforcing steel bars at the top and bottom of each concrete envelope of all ducts underneath roadways and parking areas.
7. Where new ducts, conduits, and concrete envelopes are to be joined to existing manholes, handholes, ducts, conduits, and concrete envelopes, make the joints with the proper fittings and fabricate the concrete envelopes to insure smooth durable transitions.
8. Conduit joints in concrete may be placed side by side horizontally but shall be staggered at least 150 mm (6 inches) vertically.
9. For medium voltage duct bank installations, a grounding conductor shall be extend along all electrical duct banks including stubs through each electrical distribution system manhole and to each transformer and switching-station installation.
10. Duct Bank Markers:
    a. Duct bank markers, where required, shall be located at the ends of duct banks except at manholes or handholes at approximately every 60 meter (200 feet) along the duct run and at each change in direction of the duct run. Markers shall be placed 600 mm (2 feet) to the right of the duct bank, facing the longitudinal axis of the run in the direction of the electrical load.
    b. The letter ”D” with two arrows shall be impressed or cast on top of the marker. One arrow shall be located below the letter and shall point toward the ducts. Second arrow shall be located adjacent to the letter and shall point in a direction parallel to the ducts. The letter and arrow adjacent to it shall each be approximately 75 mm (2-inches) long. The letter and arrows shall be V-shaped, and shall have a width of stroke at least 6 mm (¼ inch) at the top and a depth of 6 mm (1/4 inch).
    c. In paved areas, the top of the duct markers shall be flush with the finished surface of the paving.
    d. Where the duct bank changes direction, the arrow located adjacent to the letter shall be cast or impressed with an angle in the arrow the same as the angular change of the duct bank.

C. Concrete-Encased and Direct Burial Duct and Conduit Identification: Place continuous strip of warning tape approximately 300 mm (12 inches) above ducts or conduits before backfilling trenches. Warning tape shall be preprinted with proper identification.

D. Spare Ducts and Conduits: Where spare ducts are shown, they shall have a nylon pull rope installed. They shall be capped at each end and labeled as to location of the other end.

E. Duct and Conduit Cleaning:

1. Upon completion of the duct bank installation or installation of direct buried ducts, a standard flexible mandrel shall be pulled through each duct to loosen particles of earth, sand, or foreign material left in the line. The mandrel shall be not less than 3600 mm (12 inches) long, and shall have a diameter not less than 13 mm (1/2 inch) less than the inside diameter of the duct. A brush with stiff bristles shall then be pulled through each duct to remove the loosened particles. The diameter of the brush shall be the same as, or slightly larger than the diameter of the duct.
2. Mandrel pulls shall be witnessed by the Resident Engineer.

F. Duct and Conduit Sealing: Seal the ducts and conduits at building entrances, and at outdoor terminations for equipment, with a suitable non-hardening compound to prevent the entrance of moisture and gases.

G. Connections to Manholes: Duct bank envelopes connecting to underground structures shall be flared to have enlarged cross-section at the manhole entrance to provide additional shear strength. Dimensions of the flared cross-section shall be larger than the corresponding manhole opening dimensions by no less than 300 mm (12 inches) in each direction. Perimeter of the duct bank opening in the underground structure shall be flared toward the inside or keyed to provide a positive interlock between the duct bank and the wall of the structure. Use vibrators when this portion of the encasement is poured to assure a seal between the envelope and the wall of the structure.

H. Connections to Existing Manholes: For duct bank connections to existing structures, break the structure wall out to the dimensions required and preserve steel in the structure wall. Cut steel and extend into the duct bank envelope. Chip the perimeter surface of the duct bank opening to form a key or flared surface, providing a positive connection with the duct bank envelope.

I. Connections to Existing Ducts: Where connections to existing duct banks are indicated, excavate around the duct banks as necessary. Cut off the duct banks and remove loose concrete from the conduits before installing new concrete-encased ducts. Provide a reinforced concrete collar, poured monolithically with the new duct bank, to take the shear at the joint of the duct banks.

J. Partially Completed Duct Banks: During construction wherever a construction joint is necessary in a duct bank, prevent debris such as mud and dirt from entering ducts by providing suitable conduit plugs. Fit concrete envelope of a partially completed duct bank with reinforcing steel extending a minimum of 600 mm (2 feet) back into the envelope and a minimum of 600 mm (2 feet) beyond the end of the envelope. Provide one No. 4 bar in each corner, 75 mm (3 inches) from the edge of the envelope. Secure corner bars with two No. 3 ties, spaced approximately 300 mm (1 foot) apart. Restrain reinforcing assembly from moving during pouring of concrete.

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SECTION 26 56 00
EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 DESCRIPTION

This section specifies the furnishing, installation, and connection of exterior luminaries, controls, poles and supports.

1.2 RELATED WORK

A. Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS: General electrical requirements and items that are common to more than one section of Division 26.

B. Section 26 05 33, RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS: Conduits, fittings, and boxes for raceway systems.

C. Section 26 05 21, LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES (600 VOLTS AND BELOW): Low voltage power and lighting wiring.

D. Section 26 05 41, UNDERGROUND ELECTRICAL CONSTRUCTION: Underground handholes and conduits.

E. Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS: Requirements for personnel safety and to provide a low impedance path for possible ground fault currents.

1.3 SUBMITTALS

A. Submit in accordance with Section 26 05 11, REQUIREMENTS FOR ELECTRICAL INSTALLATIONS.

B. Shop Drawings:

1. Sufficient information, clearly presented, shall be included to determine compliance with drawings and specifications.
2. Include electrical ratings, dimensions, mounting, details, materials, required clearances, terminations, wiring and connection diagrams, photometric data, ballasts, poles, luminaries, lamps and controls.

C. Manuals: Two weeks prior to final inspection, submit four copies of operating and maintenance manuals to the Resident Engineer. Include technical data sheets, wiring and connection diagrams, and information for ordering replacement parts.

D. Certifications: Two weeks prior to final inspection, submit four copies of the following to the Resident Engineer:

1. Certification that the materials are in accordance with the drawings and specifications.
2. Certification, by the Contractor, that the complete installation has been properly installed and tested.

1.4 APPLICABLE PUBLICATIONS

Publications listed below (including amendments, addenda, revisions, supplements and errata) form a part of this specification to the extent referenced. Publications are referenced in the text by the basic designation only.

A. Aluminum Association Inc. (AA):

AAH35.1-2006 .....Alloy and Temper Designation Systems for Aluminum

B. American Association of State Highway and Transportation Officials (AASHTO):

LTS-4-2003 .....Structural Supports for Highway Signs, Luminaries and Traffic Signals

C. American Concrete Institute (ACI):

318-2005 .....Building Code Requirements for Structural Concrete

D. American National Standards Institute (ANSI):

C57.12-2000.....General Requirements For Liquid-Immersed Distribution, Power, and Regulating Transformers

C81.61-2005 .....Electrical Lamp Bases

E. American Society for Testing and Materials (ASTM):

A123/A123M-2002 .....Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

A153/A153M-2001.....Zinc Coating (Hot-Dip) on Iron and Steel Hardware – AASHTO No.: M232

B108-03a -2003 .....Aluminum-Alloy Permanent Mold Castings

D3487-2000.....Mineral Insulating Oil Used in Electrical Apparatus

F. Federal Aviation Administration (FAA):

AC 70/7460-IK CHG 1-2000.....Obstruction Lighting and Marking

AC 150/5345-43E-1995....Specification for Obstruction Lighting Equipment

G. Illuminating Engineering Society of North America (IESNA)

HB-9-2000.....Lighting Handbook

RP-8-2000 (R-2005).....Roadway Lighting

H. National Electrical Manufacturers Association (NEMA):

C78.41-2001.....Electric Lamps – Guidelines for Low-Pressure Sodium Lamps

C78.42-2004 .....Electric Lamps – Guidelines for High-Pressure Sodium Lamps

C78.43-2005 .....Electric Lamps – Single-Ended Metal-Halide Lamps

C78.1381-1998.....(R 1997) Electric Lamps – 70-Watt M85 Metal-Halide Lamps

C82.4-2002 .....Ballasts for High-Intensity-Discharge and Low-Pressure Sodium Lamps (Multiple-Supply Type)
C136.17-2005 .....Roadway Lighting Equipment – Enclosed Side-Mounted Luminaries for Horizontal-Burning High-Intensity-Discharge Lamps
ICS 2-2005 .....Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts
ICS 6-2001 .....Industrial Control and Systems Enclosures

I. National Fire Protection Association (NFPA):
70-2005 .....National Electrical Code (NEC)

J. Underwriters Laboratories, Inc. (UL):
496-2004 .....Edison-Base Lamp holders
773-1995.....Plug-in, Locking Type Photo controls, for Use with Area Lighting
773A-2006 .....Non-industrial Photoelectric Switches for Lighting Control
1029-1994.....High-Intensity-Discharge Lamp Ballasts
1598-2004 .....Luminaries

1.5 DELIVERY, STORAGE, AND HANDLING

Aluminum Poles: Do not store poles on ground. Store poles so they are at least 305 mm (one foot) above ground level and growing vegetation. Do not remove factory-applied pole wrappings until just before installing pole.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

Materials and equipment shall be in accordance with NEC, UL, ANSI, and as shown on the drawings and specified.

2.2 POLES

A. General:

1. Poles shall be round aluminum, as shown on the drawings, and as specified. Finish shall be as specified on the drawings.
2. The pole and arm assembly shall be designed for wind loading of 161 km/hr (100 miles per hour).
3. Poles shall be anchor-bolt type designed for use with underground supply conductors. Poles shall have oval-shaped handhole having a minimum clear opening of 65 by 125 mm (2.5 by 5 inches). Handhole cover shall be secured by stainless steel captive screws.
4. Provide a steel-grounding stud opposite hand hole openings.
5. Provide a base cover matching the pole in material and color to conceal the mounting hardware pole-base welds and anchor bolts.
6. Hardware: All necessary hardware shall be 300 series stainless steel.

B. Types:

1. Aluminum: Provide aluminum poles manufactured of corrosion resistant AA AAH35.1 aluminum alloys conforming to AASHTO LTS-4 for Alloy 6063-T6 or Alloy 6005-T5 for wrought alloys, and Alloy 356-T4 (3,5) for ASTM B108-03 cast alloys. Poles shall be seamless extruded or spun seamless type. Provide a pole grounding connection designed to prevent electrolysis when used with copper ground wire. Base covers for aluminum poles shall be cast from 356-T6 aluminum alloy in accordance with ASTM B108-03.

2.3 FOUNDATIONS FOR POLES

A. Foundations shall be cast-in-place concrete.

B. Foundations shall support the effective projected area of the specified pole, arm(s), and luminaire(s) under wind conditions previously specified in this section.

C. Place concrete in spirally wrapped treated paper forms for round foundations, and construct forms for square foundations.

D. Rub-finish and round all above-grade concrete edges to approximately 6 mm (1/4 inch) radius.

E. Concrete shall have 3000 psi minimum 28 day compressive strength.

F. Anchor bolt assemblies and reinforcing of concrete foundations shall be as shown on the drawings and meet ACI 318. Anchor bolts shall be in a welded cage or properly positioned by the tie wire to stirrups.

G. Prior to concrete pour, install a copperclad steel ground rod, not less than 19 mm (3/4-inch) diameter by 3000 mm (10 feet) long, below each foundation. Drive the rod vertically under the foundation so not less than 1800 mm (6 feet) of rod is in contact with the earth. Remainder of rod may be in the concrete pour. Where rock or layered rock is present, drill a hole not less than 50 mm (2 inches) in diameter and 1800 mm (6 feet) deep, backfill with tamped fine sand and drive the rod into the hole. Bond the rod to the pole with not less than number 6 AWG bare copper wires. The method of bonding shall be approved for the purpose.

2.4 LUMINAIRES

A. UL 1598 and NEMA C136.17. Luminaries shall be weatherproof, heavy duty, outdoor types designed for efficient light utilization, adequate dissipation of lamp and ballast heat and safe cleaning and relamping.

B. IESNA HB-9 and RP-8 light distribution pattern types shall be as shown on the drawings.

C. Incorporate ballasts in the luminaire housing except where otherwise shown on the drawings.

D. Lenses shall be frame-mounted heat-resistant, borosilicate glass, prismatic refractors. Attach the frame to the luminaire housing by hinges or chain. Use heat and aging resistant resilient gaskets to seal and cushion lenses and refractors in luminary doors.

E. Lamp sockets for high intensity discharge (H.I.D) fixture shall have locking type porcelain enclosures in conformance to the applicable requirements of ANSI C81.61 and UL 496.

F. Pre-wire internal components to terminal strips at the factory.

G. Bracket mounted luminaries shall have leveling provisions and clamp type adjustable slip-fitters with locking screws.

H. Materials shall be rustproof. Latches and fittings shall be non-ferrous metal.

I. IESNA Cutoff Category: Cutoff.

2.5 LAMPS

A. Install the proper lamps in every luminaire installed and every luminaire relocated or reinstalled.

B. Lamps to be general-service, outdoor lighting types.

C. LED Lamps: As indicated in the Statement of Work.

2.6 CONTROLS

A. Each Lighting System:

1. Shall be controlled by one of the following methods as shown for each system on the drawings:
   a. A photocell to act as the pilot device. The photocell shall be the type which fails safe to the closed position meeting UL 773 or 773A.
   b. A time clock to act as the pilot device.
   c. A combination, photocell-time clock to act as dual pilot devices connected in series. The photocell shall provide the "on" function at dusk and the time clock(s) shall control specific circuit "off" functions during dark hours.
   d. A time clock to act as the pilot device for a circuit (or circuits) when luminaries are individually photocell controlled.
   e. The pilot devices shall control the power circuit through the contractor or relay as shown on the drawings.
2. Mount and connect photocells and time clocks as shown on the drawings.
3. Photocells shall have the following features:
   a. Quick-response, cadmium-sulfide type.
   b. A 15 to 30 second, built-in time delay to prevent response to momentary lightning flashes, car headlights or cloud movements.

c. Energizes the system when the north sky light decreases to approximately 1.5 footcandles, and maintains the system energized until the north sky light increases to approximately 3 to 5 foot candles.

4. Time clocks shall have the following features:
   a. A 24-hour astronomic dial, motor-driven.
   b. A spring-actuated, reserve power mechanism for operating the timer during electrical power failures and that automatically winds the spring when the electrical power is restored.
5. The arrangement and method of control and the control devices shall be as shown on the drawings.

2.7 EXISTING LIGHTING SYSTEMS

A. For modifications or additions to existing lighting systems, the new components shall be compatible with the existing systems.

B. New poles and luminaries shall have approximately the same configurations and dimensions as the existing poles and luminaries except where otherwise shown on the drawings.

2.8 AUXILIARY EQUIPMENT

Parallel-Type Systems: Shall be supplied power as shown on the drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install lighting in accordance with the NEC, as shown on the drawings, and in accordance with manufacturer’s recommendations.

B. Aluminum Poles:
   1. Provide pole foundations with galvanized steel anchor bolts, threaded at the top end and bent 1.57 rad 90 degrees at the bottom end. Provide galvanized nuts, washers, and ornamental covers for anchor bolts. Thoroughly compact backfill with compacting arranged to prevent pressure between conductor, jacket, or sheath and the end of conduit. Adjust poles as necessary to provide a permanent vertical position with the bracket arm in proper position for luminaire location.
   2. After the poles have been installed, shimmed and plumbed, grout the spaces between the pole bases and the concrete base with non-shrink concrete grout material. Provide a plastic or copper tube, of not less than 9 mm (3/8-inch) inside diameter, through the grout tight to the top of the concrete base for moisture weeping.

C. Foundation Excavation: Depth shall be as indicated. Dig holes large enough to permit the proper use of tampers to the full depth of the hole. Place backfill in the hole in 150 mm (6 inch) maximum layers and

thoroughly tamp. Place surplus earth around the pole in a conical shape and pack tightly to drain water away.

3.2 GROUNDING

Ground noncurrent-carrying parts of equipment including metal poles, luminaries, mounting arms, brackets, and metallic enclosures as specified in Section 26 05 26, GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS. Where copper grounding conductor is connected to a metal other than copper, provide specially treated or lined connectors suitable and listed for this purpose.

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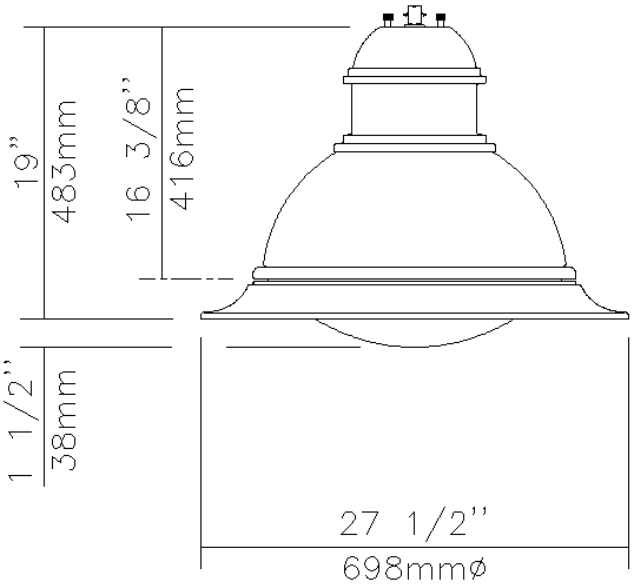
VA Roseburg Site Plan Phase 1 single head



Qty **1** Luminaire **DMS50-90W80LED4K-LE3S-480-BKTX Philips Lumec**

Description of Components:

Hood: A die cast A360.1 aluminum dome complete with a cast-in technical ring with latch and hinge. The mechanism shall offer toolfree access to the inside of the luminaire. An embedded memory-retentive gasket shall ensure weatherproofing.

Skirt: A die cast A360 aluminum skirt complete with a cast-in technical ring.

Housing: In a round shape, this housing is made of cast 356 aluminum, c/w a watertight grommet, mechanically assembled to the bracket with four bolts 3/8-16 UNC. This suspension system permits for a full rotation of the luminaire in 90 degree increments.

Lens: Clear tempered glass curved lens, mechanically assembled on the lower part of the technical ring with brackets.

Lamp: LifeLED 90W 80LED 4K

Optical System: (SCB3M), I.E.S. type III cut-off (asymmetrical). Smartseal system, composed of brightened anodized aluminum hydroformed reflector, permanently assembled on a sag lens. Weathertightness IP66 rating.

Voltage: Primary voltage 480 volts.

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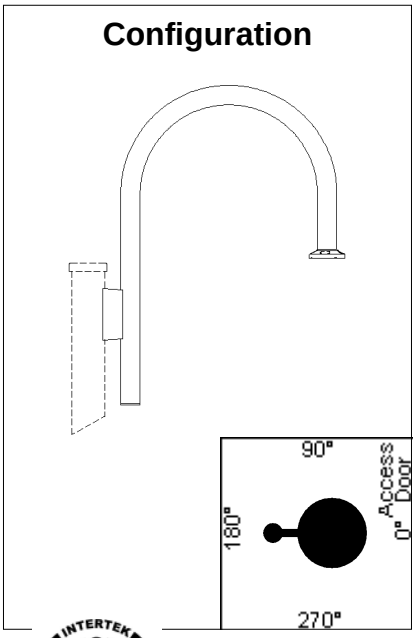
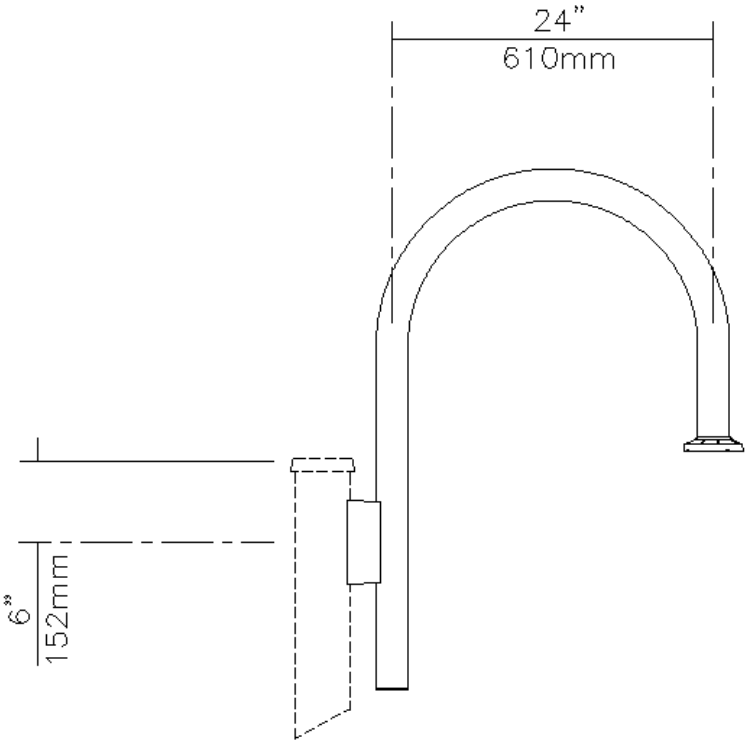
Configuration





Qty **1** Bracket **IF-1A-BKTX**

Description of Components:

Arm: Shall be made from 6061-T6 aluminum tubing, 2 3/8in. (60mm) outside diameter, mechanically assembled.

Adaptor: Made of cast 356 aluminum, mechanically assembled.

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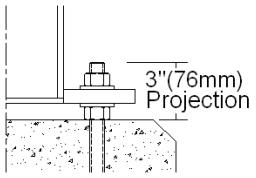
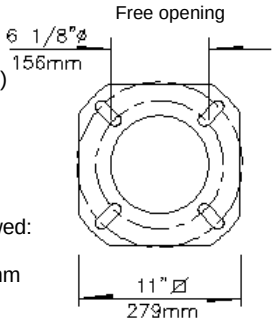
Base & Bolts Information



Comes with 4 steel anchor bolts, 3/4" X 24" + 3", 8 nuts and 8 washers. Important: Do not obstruct space between anchor plate and concrete base.

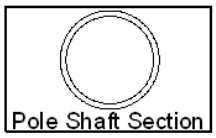
Anchor Plate



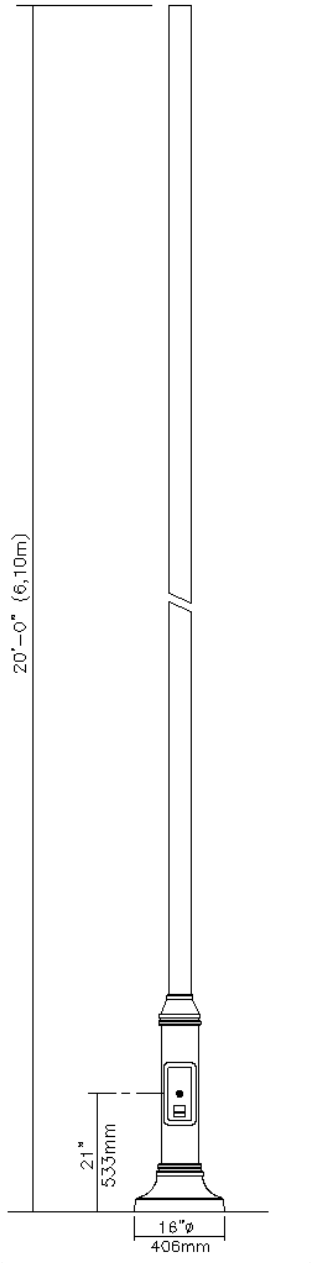
-B.C.:
10 1/2" (267mm)

- Material:
Cast Aluminum

- NOTE:
Bolt Circle Allowed:
9" to 11"
229mm to 279mm



Qty **1** Pole **AM6U-20-BKTX**



Description of Components:

Pole Shaft: Shall be made from a 4" (102mm) round extruded 6061-T6 aluminum tubing, having a 0.226" (5.7mm) wall thickness, welded to the pole base.

Joint Cover: Two-piece round joint cover made from cast 356 aluminum, mechanically fastened with stainless steel screws.

Pole Base: Shall be made from a 6 5/8" (168mm) round extruded 6061-T6 aluminum tubing base having a 0.135" (3.4mm) wall thickness, welded to both the bottom and top of the anchor plate.

Maintenance Opening: The pole shall have a 4 1/2" x 10" (114mm x 254mm) maintenance opening centered 21" (533mm) from the bottom of the anchor plate, complete with a weatherproof embossed aluminum cover and a copper ground lug.

Base Cover: Two piece round base cover made from cast 356 aluminum, mechanically fastened with stainless steel screws.

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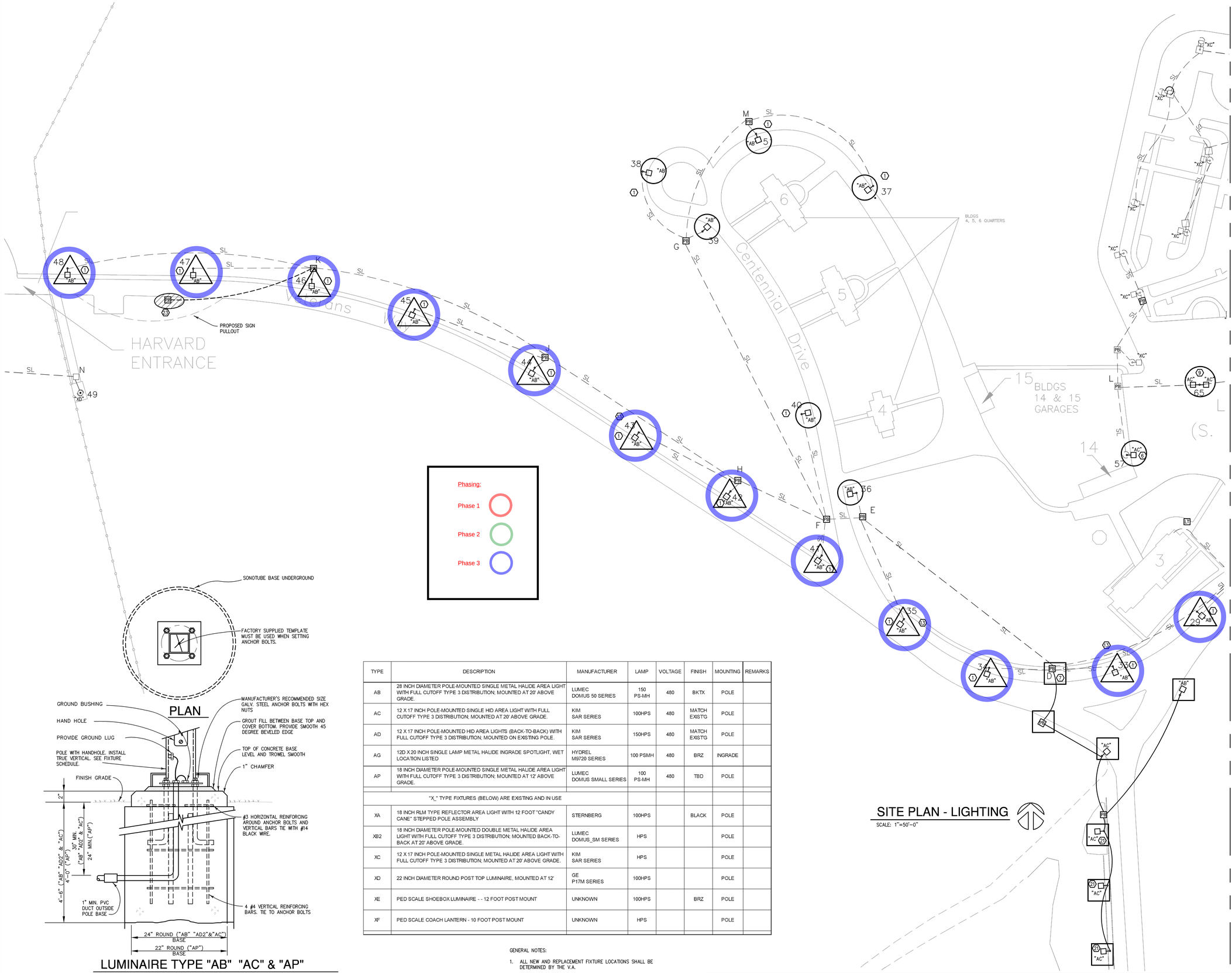
Miscellaneous

Description of Components:

Wiring: Gauge (#14) TEW wires, 6" (152mm) minimum exceeding top of pole.

Hardware: All exposed screws shall be stainless steel with Ceramic primer-seal basecoat and color stable topcoat. All seals and sealing devices are made and/or lined with EPDM and/or silicone.

Finish: Color to be black textured (BKTX). Application of a polyester powder coat paint. (4 mils/100 microns). The chemical composition provides a highly durable UV and salt spray resistant finish in accordance to the ASTM-B117-73 standard and humidity proof in accordance to the ASTM-D2247-68 standard.



Phasing:

Phase 1

Phase 2

Phase 3

SITE PLAN - LIGHTING

SCALE: 1"=50'-0"

MATCHLINE SEE SHEET E2 FOR CONTINUATION

SHEET NOTES (NOT ALL NOTES USED ON THIS PAGE):

1. DEMO EXISTING POLE MOUNTED FIXTURE AND POLE BASE AT THIS LOCATION. REPLACE WITH TYPE "AB" FIXTURE AND CONNECT TO EXISTING CIRCUIT.
2. DEMO EXISTING POLE MOUNTED FIXTURE AT THIS LOCATION.
3. REMOVE POLE MOUNTED FIXTURE ("XC") AT THIS LOCATION, (TO BE RELOCATED, SEE NOTE 19) AND DEMO POLE BASE. REPLACE WITH TYPE "AB" FIXTURE.
4. REMOVE 5 POLE MOUNTED FIXTURES FROM THIS PARKING AREA (LABELED "XA") AND CONNECT EXISTING CIRCUIT TO THREE NEW "AC" FIXTURES AT NEW LOCATIONS. SEE NOTE #5.
5. THIS CIRCUIT IS 277V.
6. SAME AS NOTE 3, REPLACE WITH TYPE "AC" FIXTURES.
7. EXTEND EXISTING CIRCUIT TO NEW PARKING AREA.
8. SAME AS NOTE 3, REPLACE WITH TYPE "AC" FIXTURES.
9. DEMO EXISTING FIXTURE AT THIS LOCATION, REPLACE WITH TWN MOUNTED TYPE "AC"LUMINAIRES ON EXISTING POLES
10. NSTALL NEW POLE MOUNTED FIXTURE AT THIS LOCATION; DETERMINE BEST ROUTE TO CIRCUIT INTO PANEL IN BUILDING #71. USE INTEGRAL PHOTOCELL IF OTHER CONTROLS ARE NOT AVAILABLE.
11. DEMO 3 GROUND-MOUNTED SPOT LIGHT LUMINAIRES AND CONDUIT.
12. MOUNT TWO "AC" FIXTURES AT LOCATIONS SHOWN, EXTEND CIRCUIT FROM NEAREST PULLBOX.
13. MODIFY POST POSITIONING TO BEST AVOID INTERFERENCE FORM TREE LIMBS; EXTEND CIRCUITS AS NEEDED.
14. MOUNT FIXTURES AT EDGE OF LAWN, FINISH CONCRETE WITH 24" SQ. PAD FLUSH TO ADJACENT SIDEWALK. EXTEND CIRCUITS FROM SITE LIGHTING.
15. DEMO EXISTING "XF" FIXTURES AND REDIRECT CIRCUIT TO NEW "AP" FIXTURE ON PATH.
16. DEMO EXISTING "XD" FIXTURE AND REPLACE WITH TYPE "AP" FIXTURE.
17. DEMO EXISTING "XF" FIXTURE, REPLACE WITH "AP" FIXTURE AT SAME LOCATION, WITH 120 VOLT BALLAST.
18. RETROFIT "XC" FIXTURE AT THIS LOCATION TO 100W MH LAMP AND BALLAST.
19. MOUNT TYPE "XC" FIXTURE AT THIS LOCATION AND EXTEND CIRCUIT FROM NEAREST PULL BOX.
20. INSTALL NEW POLE MOUNTED FIXTURE AT THIS LOCATION; DETERMINE BEST ROUTE TO CIRCUIT.
21. EXTEND CONCRETE POLE BASE UP 36 INCHES FROM GRADE; TRIM POLE 36", REDRILL.
22. SET POLE BASE BACK 36 INCHES FROM CURB.
23. LOCATION TO BE DETERMINED.

SYMBOLS

- GROUND MOUNTED FLOOD.
- POLE MOUNTED AREA LIGHT.
- POLE TOP MOUNTED AREA LIGHT.
- POLE MOUNTED TWIN ASSEMBLY AREA LIGHT.
- EXISTING BOLLARD.
- PB PULL BOX (IN-GROUND).
- LT PANEL LOCATIONS FOR SITE LIGHTING CIRCUITS.
- EXISTING POLE TOP MOUNTED AREA LIGHT.
- EXISTING LIGHTING CIRCUITS.
- NEW LIGHTING CIRCUITS.

LUMINAIRE TYPE "AB" "AC" & "AP"

POLE MOUNTED BASE DETAIL

NO SCALE

TYPE	DESCRIPTION	MANUFACTURER	LAMP	VOLTAGE	FINISH	MOUNTING	REMARKS
AB	28 INCH DIAMETER POLE-MOUNTED SINGLE METAL HALIDE AREA LIGHT WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED AT 20' ABOVE GRADE.	LUMEC DOMUS 50 SERIES	150 PS-MH	480	BKTX	POLE	
AC	12 X 17 INCH POLE-MOUNTED SINGLE HID AREA LIGHT WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED AT 20' ABOVE GRADE.	KIM SAR SERIES	100HPS	480	MATCH EXISTG	POLE	
AD	12 X 17 INCH POLE-MOUNTED HID AREA LIGHTS (BACK-TO-BACK) WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED ON EXISTING POLE.	KIM SAR SERIES	150HPS	480	MATCH EXISTG	POLE	
AG	12D X 20 INCH SINGLE LAMP METAL HALIDE INGRADE SPOTLIGHT, WET LOCATION LISTED	HYDREL M9720 SERIES	100 PSMH	480	BRZ	INGRADE	
AP	18 INCH DIAMETER POLE-MOUNTED SINGLE METAL HALIDE AREA LIGHT WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED AT 12' ABOVE GRADE.	LUMEC DOMUS SMALL SERIES	100 PS-MH	480	TBD	POLE	
	"X_" TYPE FIXTURES (BELOW) ARE EXISTING AND IN USE						
XA	18 INCH RLM TYPE REFLECTOR AREA LIGHT WITH 12 FOOT "CANDY CANE" STEPPED POLE ASSEMBLY	STERNBERG	100HPS		BLACK	POLE	
XB2	18 INCH DIAMETER POLE-MOUNTED DOUBLE METAL HALIDE AREA LIGHT WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED BACK-TO-BACK AT 20' ABOVE GRADE.	LUMEC DOMUS_SM SERIES	HPS			POLE	
XC	12 X 17 INCH POLE-MOUNTED SINGLE METAL HALIDE AREA LIGHT WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED AT 20' ABOVE GRADE.	KIM SAR SERIES	HPS			POLE	
XD	22 INCH DIAMETER ROUND POST TOP LUMINAIRE, MOUNTED AT 12'	GE P17M SERIES	100HPS			POLE	
XE	PED SCALE SHOEBOX LUMINAIRE - - 12 FOOT POST MOUNT	UNKNOWN	100HPS		BRZ	POLE	
XF	PED SCALE COACH LANTERN - 10 FOOT POST MOUNT	UNKNOWN	HPS			POLE	

GENERAL NOTES:

1. ALL NEW AND REPLACEMENT FIXTURE LOCATIONS SHALL BE DETERMINED BY THE V.A.
2. ALL DEMOED POLE BASES SHALL BE REMOVED BY CONTRACTOR, LANDSCAPE SHALL BE RESTORED.
3. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF OLD FIXTURES AND POLES.

CHECK SET
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06/26/09

BALZHISER & HUBBARD ENGINEERS
MECHANICAL ELECTRICAL CIVIL SURVEYORS
520 WEST 13TH AVENUE EUGENE, OR 97401
P: 541-686-8470 F: 541-343-5363
0900-002-08e1-2.dwg

2form ARCHITECTURE
255 West 13th Avenue Eugene, OR 97401 T: 541.342.5727 www.2form.com

V.A. ROSEBURG HEALTHCARE SYSTEM
VISN20

PROJECT TITLE: UPGRADE STREET LIGHTING
ROSEBURG, OREGON

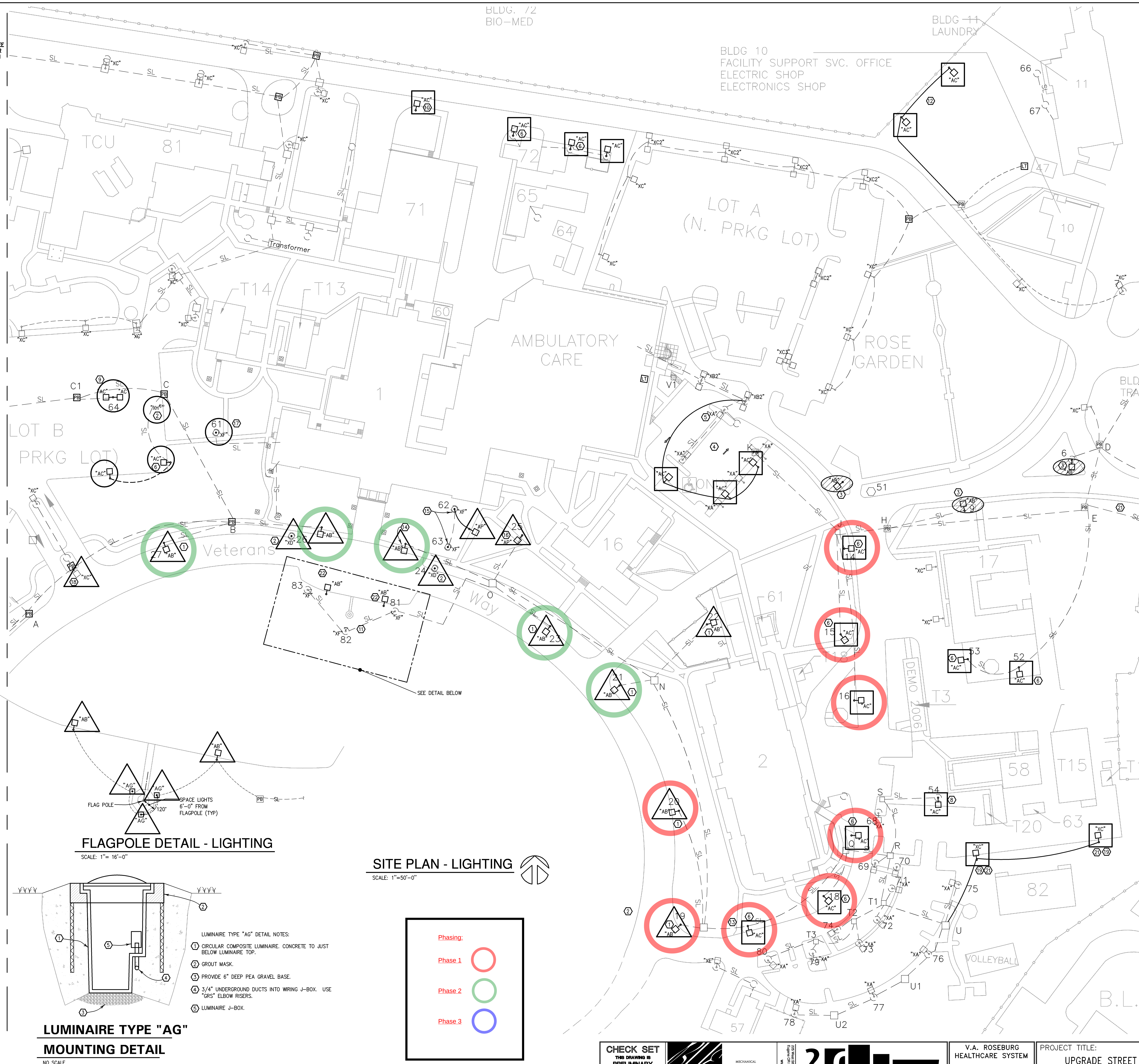
DRAWING TITLE: SITE PLAN – LIGHTING

PROJECT NO.: XXX-XX-XXX
DATE: 06/17/08

DESIGNED	CHECKED	REVIEWED	DRAFTED	BUILDING No.:	FLOOR No.:	SHT. 1 of 2
JEM	KMW	.	.	.	SITE	E1

PROTECT OF FACILITIES

MATCHLINE SEE SHEET E1 FOR CONTINUATION



Phasing:

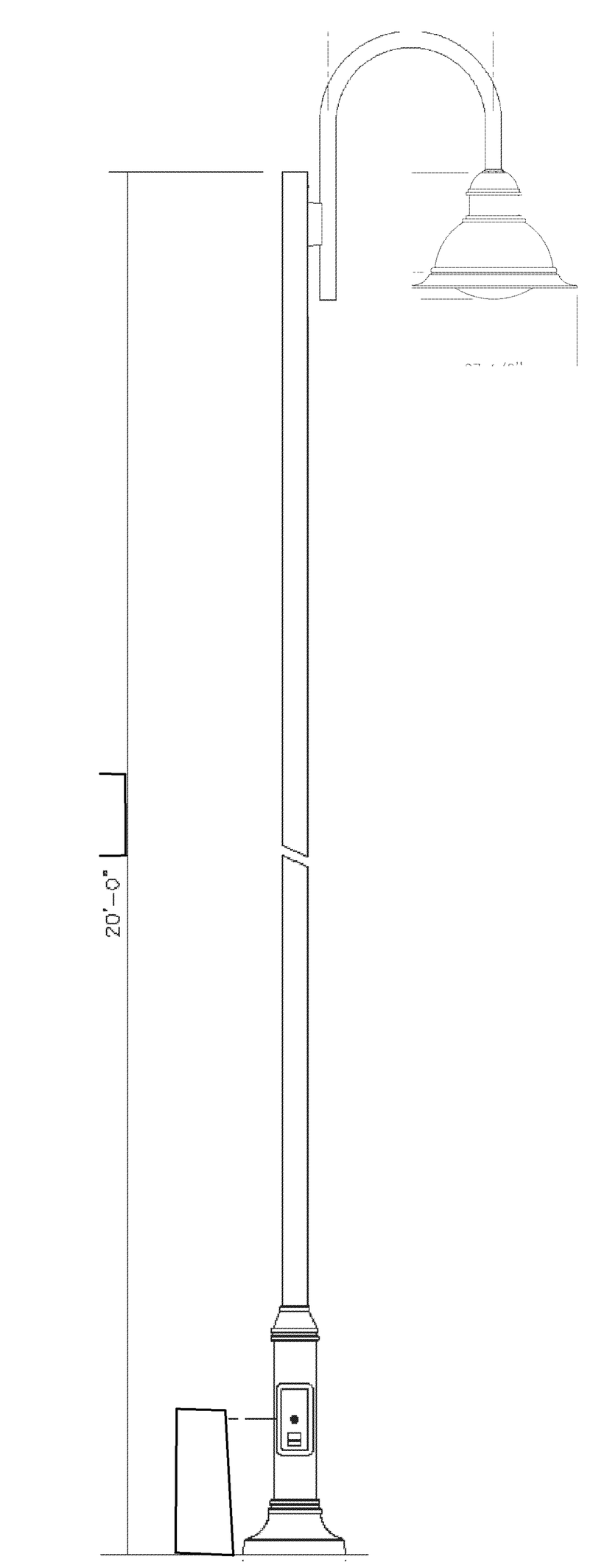
- Phase 1
- Phase 2
- Phase 3

GENERAL NOTES:

1. ALL NEW AND REPLACEMENT FIXTURE LOCATIONS SHALL BE DETERMINED BY THE V.A.
2. ALL DEMOED POLE BASES SHALL BE REMOVED BY CONTRACTOR, LANDSCAPE SHALL BE RESTORED.
3. CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF OLD FIXTURES AND POLES.

SHEET NOTES (NOT ALL NOTES USED ON THIS PAGE):

1. DEMO EXISTING POLE MOUNTED FIXTURE AND POLE BASE AT THIS LOCATION. REPLACE WITH TYPE "AB" FIXTURE AND CONNECT TO EXISTING CIRCUIT.
2. DEMO EXISTING POLE MOUNTED FIXTURE AT THIS LOCATION.
3. REMOVE POLE MOUNTED FIXTURE ("XC") AT THIS LOCATION, (TO BE RELOCATED, SEE NOTE 19) AND DEMO POLE BASE. REPLACE WITH TYPE "AB" FIXTURE.
4. REMOVE 5 POLE MOUNTED FIXTURES FROM THIS PARKING AREA (LABELED "XA") AND CONNECT EXISTING CIRCUIT TO THREE NEW "AC" FIXTURES AT NEW LOCATIONS. SEE NOTE #5.
5. THIS CIRCUIT IS 277V.
6. SAME AS NOTE 3, REPLACE WITH TYPE "AC" FIXTURES.
7. EXTEND EXISTING CIRCUIT TO NEW PARKING AREA.
8. SAME AS NOTE 3, REPLACE WITH TYPE "AC" FIXTURES.
9. DEMO EXISTING FIXTURE AT THIS LOCATION, REPLACE WITH TWIN MOUNTED TYPE "AC"LUMINAIRES ON EXISTING POLES
10. NSTALL NEW POLE MOUNTED FIXTURE AT THIS LOCATION; DETERMINE BEST ROUTE TO CIRCUIT INTO PANEL IN BUILDING #71. USE INTEGRAL PHOTOCELL IF OTHER CONTROLS ARE NOT AVAILABLE.
11. DEMO 3 GROUND-MOUNTED SPOT LIGHT LUMINAIRES AND CONDUIT.
12. MOUNT TWO "AC" FIXTURES AT LOCATIONS SHOWN, EXTEND CIRCUIT FROM NEAREST PULLBOX.
13. MODIFY POST POSITIONING TO BEST AVOID INTERFERENCE FORM TREE LIMBS; EXTEND CIRCUITS AS NEEDED.
14. MOUNT FIXTURES AT EDGE OF LAWN, FINISH CONCRETE WITH 24" SQ. PAD FLUSH TO ADJACENT SIDEWALK. EXTEND CIRCUITS FROM SITE LIGHTING.
15. DEMO EXISTING "XF" FIXTURES AND REDIRECT CIRCUIT TO NEW "AP" FIXTURE ON PATH.
16. DEMO EXISTING "XD" FIXTURE AND REPLACE WITH TYPE "AP" FIXTURE.
17. DEMO EXISTING "XF" FIXTURE, REPLACE WITH "AP" FIXTURE AT SAME LOCATION, WITH 120 VOLT BALLAST.
18. RETROFIT "XC" FIXTURE AT THIS LOCATION TO 100W MH LAMP AND BALLAST.
19. MOUNT TYPE "XC" FIXTURE AT THIS LOCATION AND EXTEND CIRCUIT FROM NEAREST PULL BOX.
20. INSTALL NEW POLE MOUNTED FIXTURE AT THIS LOCATION; DETERMINE BEST ROUTE TO CIRCUIT.
21. EXTEND CONCRETE POLE BASE UP 36 INCHES FROM GRADE; TRIM POLE 36", REDRILL.
22. SET POLE BASE BACK 36 INCHES FROM CURB.
23. LOCATION TO BE DETERMINED.



POLE DETAIL
SCALE: NONE

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BALZHISER & HUBBARD ENGINEERS
MECHANICAL • ELECTRICAL • CIVIL • SURVEYORS
100 WEST 13TH AVENUE EUGENE, OR 97401
P: 541-686-8478 F: 541-345-5303
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225 West 5th Avenue Eugene OR 97401 p. 541.342.5777 f. 541.342.6128 www.2-form.com
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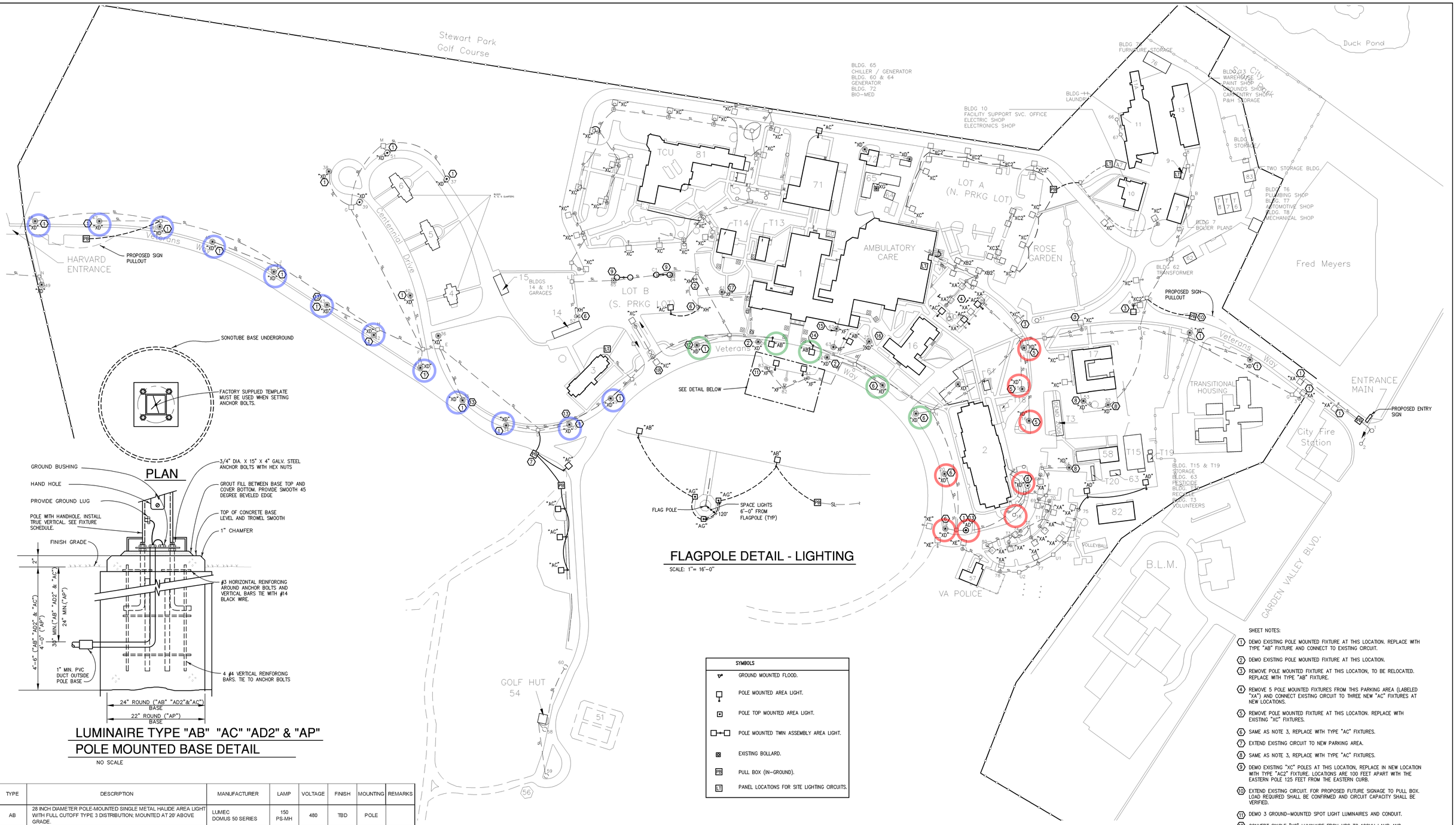
V.A. ROSEBURG HEALTHCARE SYSTEM
VISN20

PROJECT TITLE: UPGRADE STREET LIGHTING, ROSEBURG, OREGON				DRAWING TITLE: SITE PLAN – LIGHTING		PROJECT NO.: XXX-XX-XXX
						DATE: 06/17/08
DESIGNED JEM	CHECKED KMW	REVIEWED .	DRAFTED .	BUILDING No.: .	FLOOR No.: SITE	SHT. 2 of 2 E2

OFFICE OF FACILITIES



PLAN

LUMINAIRE TYPE "AB" "AC" "AD2" & "AP"
POLE MOUNTED BASE DETAIL

NO SCALE

FLAGPOLE DETAIL - LIGHTING

SCALE: 1"= 16'-0"

TYPE	DESCRIPTION	MANUFACTURER	LAMP	VOLTAGE	FINISH	MOUNTING	REMARKS
AB	28 INCH DIAMETER POLE-MOUNTED SINGLE METAL HALIDE AREA LIGHT WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED AT 20' ABOVE GRADE.	LUMEC DOMUS 50 SERIES	150 PS-MH	480	TBD	POLE	
AC	12 X 17 INCH POLE-MOUNTED SINGLE HID AREA LIGHT WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED AT 20' ABOVE GRADE.	KIM SAR SERIES	100HPS	480	MATCH EXISTG	POLE	
AD2	DUAL 12 X 17 INCH POLE-MOUNTED HID AREA LIGHTS (BACK-TO-BACK) WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED AT 24' ABOVE GRADE.	KIM SAR SERIES	150HPS	480	MATCH EXISTG	POLE	
AP	18 INCH DIAMETER POLE-MOUNTED SINGLE METAL HALIDE AREA LIGHT WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED AT 12' ABOVE GRADE.	LUMEC DOMUS SMALL SERIES	100 PS-MH	480	TBD	POLE	
	"X_" TYPE FIXTURES (BELOW) ARE EXISTING AND IN USE						
XA	18 INCH RLM TYPE REFLECTOR AREA LIGHT WITH 12 FOOT "CANDY CANE" STEPPED POLE ASSEMBLY	STERNBERG	100HPS		BLACK	POLE	
XB2	18 INCH DIAMETER POLE-MOUNTED DOUBLE METAL HALIDE AREA LIGHT WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED BACK-TO-BACK AT 20' ABOVE GRADE.	LUMEC DOMUS_SM SERIES	HPS			POLE	
XC	12 X 17 INCH POLE-MOUNTED SINGLE METAL HALIDE AREA LIGHT WITH FULL CUTOFF TYPE 3 DISTRIBUTION; MOUNTED AT 20' ABOVE GRADE.	KIM SAR SERIES	HPS			POLE	
XD	22 INCH DIAMETER ROUND POST TOP LUMINAIRE, MOUNTED AT 12'	GE P17M SERIES	100HPS			POLE	
XE	PED SCALE SHOEBOX LUMINAIRE - - 12 FOOT POST MOUNT	UNKNOWN	100HPS		BRZ	POLE	
XF	PED SCALE COACH LANTERN - 10 FOOT POST MOUNT	UNKNOWN	HPS			POLE	

SYMBOLS	
	GROUND MOUNTED FLOOD.
	POLE MOUNTED AREA LIGHT.
	POLE TOP MOUNTED AREA LIGHT.
	POLE MOUNTED TWIN ASSEMBLY AREA LIGHT.
	EXISTING BOLLARD.
PB	PULL BOX (IN-GROUND).
LT	PANEL LOCATIONS FOR SITE LIGHTING CIRCUITS.

Phasing:

Phase 1

Phase 2

Phase 3

SITE PLAN - LIGHTING

SCALE: 1"=100'-0"

SHEET NOTES:

1. DEMO EXISTING POLE MOUNTED FIXTURE AT THIS LOCATION. REPLACE WITH TYPE "AB" FIXTURE AND CONNECT TO EXISTING CIRCUIT.
2. DEMO EXISTING POLE MOUNTED FIXTURE AT THIS LOCATION.
3. REMOVE POLE MOUNTED FIXTURE AT THIS LOCATION, TO BE RELOCATED. REPLACE WITH TYPE "AB" FIXTURE.
4. REMOVE 5 POLE MOUNTED FIXTURES FROM THIS PARKING AREA (LABELED "XA") AND CONNECT EXISTING CIRCUIT TO THREE NEW "AC" FIXTURES AT NEW LOCATIONS.
5. REMOVE POLE MOUNTED FIXTURE AT THIS LOCATION. REPLACE WITH EXISTING "XC" FIXTURES.
6. SAME AS NOTE 3, REPLACE WITH TYPE "AC" FIXTURES.
7. EXTEND EXISTING CIRCUIT TO NEW PARKING AREA.
8. SAME AS NOTE 3, REPLACE WITH TYPE "AC" FIXTURES.
9. DEMO EXISTING "XC" POLES AT THIS LOCATION, REPLACE IN NEW LOCATION WITH TYPE "AC2" FIXTURE. LOCATIONS ARE 100 FEET APART WITH THE EASTERN POLE 125 FEET FROM THE EASTERN CURB.
10. EXTEND EXISTING CIRCUIT. FOR PROPOSED FUTURE SIGNAGE TO PULL BOX. LOAD REQUIRED SHALL BE CONFIRMED AND CIRCUIT CAPACITY SHALL BE VERIFIED.
11. DEMO 3 GROUND-MOUNTED SPOT LIGHT LUMINAIRES AND CONDUIT.
12. CONVERT SINGLE "XC" LUMINAIRE FROM HPS TO 100MH LAMP AND BALLAST.
13. MODIFY POST POSITIONING TO BEST AVOID INTERFERENCE FORM TREE LIMBS; EXTEND CIRCUITS AS NEEDED.
14. MOUNT FIXTURES AT EDGE OF LAWN, FINISH CONCRETE WITH 24" SQ. PAD FLUSH TO ADJACENT SIDEWALK. EXTEND CIRCUITS FROM SITE LIGHTING.
15. DEMO EXISTING "XF" FIXTURES AND REDIRECT CIRCUIT TO NEW "AP" FIXTURE ON PATH.
16. DEMO EXISTING "XD" FIXTURE AND REPLACE WITH TYPE "AP" FIXTURE.
17. DEMO EXISTING "XF" FIXTURE, REPLACE WITH "AP" FIXTURE AT SAME LOCATION.
18. RETROFIT "XC" FIXTURE AT THIS LOCATION TO 100W MH LAMP AND BALLAST.

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MECHANICAL
ELECTRICAL
CIVIL
&
TRANSPORTATION
CONSULTANTS
100 WEST 13TH AVENUE
EUGENE, OR 97401
P: 541-686-8478
F: 541-345-5802
2000-002-08e1.dwg
2000 West 6th Avenue
Eugene, OR 97402
T: 541.342.2777
F: 541.342.8278
2form ARCHITECTURE

V.A. ROSEBURG HEALTHCARE SYSTEM
VISN20

PROJECT TITLE:
UPGRADE STREET LIGHTING
ROSEBURG, OREGON

DRAWING TITLE:
SITE PLAN – LIGHTING

PROJECT NO.: XXX-XX-XXX
DATE: 06/17/08

DESIGNED	CHECKED	REVIEWED	DRAFTED	BUILDING No.:	FLOOR No.:	SHT. X of X
.	KMW	XXX	.	.	SITE	E1

bridge to FACILITIES

Statement of Work
653-13-111 Upgrade Street Lighting

1. DESCRIPTION OF WORK:

This project includes the removal of existing light poles and concrete bases and the installation of new LED decorative light fixtures, poles and bases as identified on the drawings and in the specifications.

The Project is located on the Roseburg VAMC campus along Veterans Way, primarily in front of Buildings 2, 16, and 1. The site and buildings are listed as eligible for the National Historic Register and matching the existing decorative lighting currently installed along Veterans Way starting at the Garden Valley entrance is essential.

The streets and parking areas will remain occupied during construction and all work shall be accomplished to minimize disruption to vehicular and pedestrian traffic. A phasing plan for construction work shall be required to be submitted for approval.

Bid options will be considered to be additive in nature and could be exercised at time of award or after Notice to Proceed as delineated in statement of bid items found in the General Requirements.

> **Base bid** includes all work identified on the drawings as phase 1, which includes the removal and replacement of 8 light poles and all associated work.
>
> **Bid Option 1** includes all work identified on the drawings as phase 2, which includes the removal and replacement of 5 light poles and all associated work.
>
> **Bid Option 2** includes all work identified on the drawings as phase 3, which includes the removal and replacement of 12 light poles and all associated work.

The Contractor shall provide all labor, materials and equipment for the demolition, construction, and post construction services needed to complete the project.

Contractor will be responsible for all repairs to damaged landscaping, curbs, sidewalks and utilities as a result of construction. Contractor shall verify voltages at existing light poles prior to ordering new fixtures.

2. LIGHT POLE REQUIREMENTS:

Supply, deliver and install street lighting fixtures to include lighting fixture, mounting hardware, light pole and concrete pole base. Contractor shall install the following light fixtures to match the existing decorative light fixtures on campus:

Decorative Single LED Light Fixture

Model Number: DMS50-90W80LED4K-LE3S-480-BKTX Philips Lumec
Quantity – 3 EA
Luminaire – DMS50-SCB
Lighting Lamp – LifeLED 90W 80LED 4K
Voltage – 480V
Lens – Sag Lens LE3S
Finish – Black Textured

Decorative Mounting Arm

Model Number: IF-1A-BKTX Philips Lumec
Quantity - 3 EA
Finish – Black Textured

Decorative 20’ Pole

Model Number: AM6U-20-BKTX Philips Lumec
Quantity – 3 EA
Height – 20 feet
Pole – 4 inch round
Finish – Black Textured

3. CONDITIONS OF THE PROJECT

- General: The Contractor shall provide all labor, materials and equipment for the demolition and construction, and post construction services needed to complete the project. Services shall also include waste management, disposal, and monitoring.

- Project Management: This project will require a high level of coordination with VA staff. Regularly scheduled project meetings shall be required in order to facilitate this communication.

- Construction Inspection: The Contractor shall develop and implement a Quality control plan that includes project inspection for the duration of the construction period of the project in accordance with specification.

- Construction: The Contractor shall provide all labor, materials and equipment for demolition and installation in construction project areas.

- Life Safety: When life safety is impacted, the Contractor shall design interim life safety measures as part of the construction documents.

- Project meetings shall be held on a bi-weekly basis or more frequently if needed. The contractor shall plan and coordinate the project meetings.

- VA meeting room facilities may be utilized for project meetings. The Contractor shall coordinate with Facilities Management Service (Building 10) for use of VA facilities.

- The Contractor shall have an authorized representative on site at all times during project construction. The authorized representative shall have the authority to receive instruction from the Government and direct the actions of Contractor employees and all subcontractors.

- Contractor shall develop a “Submittal Register” based on the included specification sections. After submittals are reviewed for compliance, the Contractor shall log them in the submittal register. A copy of the submittal register will be returned with the submittals.

- Submittals shall be submitted ten (10) working days, excluding federal holidays, prior to proceeding with that portion of the contract work which requires submittal approval. Delays attributable to untimely and rejected submittals will not serve as a basis for extending contract time for completion. Partial submittals will not be accepted unless authorized by the Contracting Officer or COTR.

- The Contractor shall retain copies of everything submitted. The intent of this requirement is to save time, whereby many questions can be resolved by telephone and to ensure that true copies are available in the event of loss or damage during the reproduction cycle. It will further assist in the consummation of contract awards in the event potential bidders uncover problems wherein Contractor prepared amendments may be necessary.

- Quality Control: The contractor shall design and implement a quality control plan to ensure that construction is performed in accordance with the specifications. The quality control plan shall include a minimum of one construction inspection per week at the job site and at critical junctures to ensure compliance with the specifications. Copies of all inspection reports, commissioning reports, materials testing reports and safety inspections shall be provided to the COTR on a weekly basis at a minimum.

- Background Information: Information, including drawings and other documentation, provided to the Contractor, shall be used for reference only. The Contractor shall field check everything and shall not use any drawings provided for plan or elevation views. The final drawings submitted by the Contractor shall be originals and shall be the result of his field check, and shall not be take-offs or tracings, for any drawings or other information provided.

- All Contractor and subcontractor owners and employees shall adhere to the Roseburg VAMC security and safety requirements while on site.